WEATHER
Fair tonight and probably Tuesday. Warmer tonight with light southeast winds.

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"Big Four" Walkout Spreads In South

Balzer Reveals New Murder Details; Northcliffe Dies

Saw Auto He Tells Detective

Car Sped Toward Spring Green After Murder, He Declares

Police officers and detectives [illegible] again today depending upon William Balzer, lying at the point [illegible] death in the Sauk City hospital, [illegible] information which will lead to [illegible] of the murderers of his [illegible], and sister, Mary, [illegible] ago. The search has [illegible] abandoned at the [illegible] the crime and all efforts [illegible] on finding the crimi[illegible]

[illegible] of consciousness came [illegible] William Balzer today and [illegible] mumblings, A. [illegible] Wilson detective, obtain[illegible] information that will lead [illegible] of the murder.

[illegible] reluctant to dis[illegible] and whether this is, [illegible] condition or nat[illegible] is hard to determine. [illegible] Monday morning related [illegible] the garage and a [illegible] of the bandits.

"[illegible] two bandits," he told [illegible]

"[illegible] you recognize them?" he [illegible]

"[illegible] were two bandits."

"[illegible] in bed?"

"[illegible] but Mary was."

"[illegible] asked for money. I told [illegible] we had no money." Several [illegible] to get him to tell who the [illegible] were only resulted in the [illegible] "I do no know."

[illegible] has not been told of the death [illegible] brother and sister but will [illegible] be told today.

[illegible] of William [illegible] afternoon re[illegible] that the bandits [illegible] Green immedi[illegible] attack. In a state[illegible] the survivor told of [illegible] of the robbers at about [illegible] of the night of the mur[illegible] no information can be ob[illegible] regarding the battle in the [illegible]

[illegible] authorities werer hope[illegible] the recovery of the suffer[illegible] it is feared that he [illegible] disabled as re[illegible] Dr. A. T. John[illegible] experience [illegible] as a result of [illegible] France with the A [illegible] wounds in th[illegible] only explanation of [illegible] William Balzer [illegible] according to the sur[illegible] amputation would have [illegible] to save his life any[illegible] escape of blood pres[illegible] results.

[illegible] two brothers, [illegible] were found [illegible] They denied all [illegible] the crime when ques[illegible] Atty. Bohn and [illegible] the trio vouch for [illegible]

[illegible] her two brothers, [illegible] had gone to the [illegible] visit at the re[illegible] during the [illegible] had been told by [illegible] a couple who [illegible] and had [illegible] way into their [illegible] idea of the [illegible]

[illegible] pieced [illegible] tortur[illegible] the [illegible] money. [illegible] bruises, [illegible] plainly [illegible] had [illegible] wor-

[illegible] of William Balzer [illegible] little re[illegible] on most of his [illegible] Dr. A. T. John[illegible] that his [illegible] still out of his [illegible] nourishment [illegible] moments [illegible] information.

Lewis Gets New Offer To Settle Coal Strike From Operators' Head

Ask Agreement To Wage Scale In Force Before Walkout

(By the Associated Press)

CLEVELAND, Ohio. — An offer to end the anthracite strike by agreeing to the wage scale in force when the strike was called, was received today by Pres. John L. Lewie, of the miners. It came from S. D. Warriner, heading the anthracite operators scale committee.

Accepting Mr. Warriner's invitation to meet the operators in conference at Philadelphia on Wednesday, Mr. Lewis said:

"The broad premise upon which you have based your invitation is commendable and augurs well for the success of the conference."

Action Follows Conference

(By the Associated Press)

PHILADELPHIA, Pa. —Samuel D. Warriner, spokesman for the anthracite coal operators, announced today that he had notified John L. Lewis that the mine owners were willing to resume operations in the hard coal fields at the old wage scale pending the appointment of a commission to investigate the situation.

Mr. Warriner's action followed a conference yesterday with United States Sen. George Wharton Pepper Gov. Sproul, W. J. Richards, president of the Philadelphia and Reading Coal and Iron Co. and William A. Glasgow, Jr., counsel for the United Mine Workers.

At this meeting, it became known today, Sen. Pepper read a letter from Pres. Harding in which the President declared that further delay in the resumption of mining would mean "danger of nothing short of nation-wide disaster."

Woolley Dies

Dry Candidate For President And Former Madison Man Is Dead

John Granville Wooley, twice prohibition candidate for president, who died yesterday in Granada, Spain, after an illness of several weeks, was a former Madison man. He took up the practice of law at Paris following his graduation from Ohio Wesleyan University in 1871 and from the law school of University of Michigan two years later. He was born at Collinsville, O., on Feb. 15, 1850.

Mr. Woolley moved from Paris to Minneapolis where he served a term as prosecuting attorney.

He was the author of several books dealing with the liquor probleb. For a time he lived in Chicago, going thence to Madison, his home during the later years of his life. Mrs. Wooley died at Paris, Ill., last January.

A son, J. R. Wooley, Madison, survives.

Judge Stolen Delivers Religious Address Here

Judge O. A. Stolen delivered a religious address at the Bethel Lutheran church yesterday morning. Judge Stolen has frequently spoken from the pulpit of the church.

M. E. Gates, College President, Dies Suddenly

LITTLETON, N. H.—Merril E. Gates, member U. S. board of Indian commissioners, and former president of Amherst and Rutgers colleges, died.

WEATHER

The highest temperature during the past 24 hours was 87 degrees, 3 p. m., and the lowest was 67 at 6 a. m. this morning. Sun sets at 7:02 tonight. Fair weather with rising temperatures accompany a high barometer in north and in upper Mississippi valley to New England. Low barometer in the northern plains accompanied by showers and thunderstorms. Showers are reported throughout the south.

Stolen Declares War on Liquor Violaters; Jails Eleven Men Charged With Drunkenness

[illegible] arrested by po[illegible] week-end on [illegible] drunk, were [illegible] county jail by [illegible] today after [illegible] super[illegible] [illegible] Ben Glyke, [illegible] Ben[illegible] James [illegible] Wil[illegible] Er[illegible] Dunn.

The [illegible] of the number of "drunks" and frequent returns of the same men on the same charge caused the jailing [illegible] Judge Stolen said.

"[illegible] after time the same [illegible] appear here," declared [illegible] Stolen. "It must be stopped."

Surprisingly feeble memories were displayed by the men as one after another they were questioned by the judge as to the source of their supply.

"I bought it from a stranger," was the reply made by most of them, and none of them were able to remember the names of the liquor dispensers.

"After you spend a little time in jail your memories may be refreshened," declared Judge Stolen.

W. Meadowcraft and Thomas Moran forfeited their bail on the same charge when they failed to appear in court.

Her Husbands Are Hobbies

Nora Bayes.

NEW YORK—What's a husband or two among friends? With Nora Bayes, apparently, husbands are hobbies.

The vaudeville and musical comedy star is now "on the ragged edge" from her fourth husband, Arthur Gordon.

Husbands may grow monotonous to Miss Bayes and she may tire of them, but somehow or other she is seldom without one.

In her latest experience in divorce court, Referee John Dodfrey Saxe recommended to the supreme court that her husband be granted a divorce after witnesses had described a raid on an apartment said to have been occupied by Miss Bayes and one Arthur Welton, alleged to be a Baltimore banker.

Miss Bayes, or Leonora Goldberg, to use her maiden name, married C. A. Gressing in Chicago in her first fling into the matrimonial game. Stage success came and with it a divorce.

Then Jack Norworth became husband No. 2. He soon became monotonous, and Harry Clarke, Nora's dancing partner, took his place, but a divorce followed within a year.

Premiers Fail To Agree And Call Off Meet

Adjourn Session Without Reaching Agreement On Germany

(By the Associated Press)

LONDON — The allied premiers who have been discussing the German reparations question here since last Monday, adjourned today's session without reaching any agreement or making arrangements for another meeting.

Premier Poincare of France, and Mr. Loyd George, the British Prime minister, were as far apart as ever in their views of the situation.

The French and British premiers parted with the intention of reflecting on the situation until tomorrow. Each appeared reluctant to break up the conference but neither was inclined to yield.

Jewish School

Jewish Community School To Accommodate Over 200 Pupils

Jewish community school is to be established in the Madison Jewish synagogue, Mound st., organized by Rabbi I. Fink, Philadelphia, who will act as principal. The school will accommodate 200 children of the primary grades. On Friday evening and Saturday mornings children's religious services will be held. A meeting of members of the synagogue for organization will be held tomorrow night at 7:30 in the synagogue.

Georgia's Peach Crop Valued At $8,000,000

ATLANTA, Ga.—Georgia's peach crop this year is worth more than $8,000,000. This is third largest crop grown.

JEFFERSON—A. C. Erman has been appointed receiver for the Jefferson Rubber company, following the filing of a petition by creditors, which asserte dthat only half the company's $75,000 assets were collectable.

Nearly 8,000 Attend Local Elk Barbecue

Stunts Feature Varied Program At Esther Beach Sunday

Nearly 8,000 people attended the annual Elks' barbecue and outing yesterday afternoon and evening at Esther Beach. The afternoon was featured by airplane stunts, a Charlie Chaplin performance and singing by Enrico Cabooso. A 30 piece band from Baraboo furnished music for the dancing and concert. Races and stunts with appropriate prizes were given for the competition and entertainment of all.

Three big beeves were used by the Elks for the barbecue. A trench 12 feet long and about five feet deep was used as an oven in barbecuing the beef. Charcoal was laid on the bottom of the trench and served for fuel. Nearly everyone who attended the picnic was interested in the barbecue.

Mrs. Kaether To Be Buried Here Wednesday

Mrs. William Kaether, 56, died at a local hospital Sunday evening. Funeral services will be held at the home, 109 North Lake st., Wednesday morning at 8:30, with services in the Holy Redeemer church at 9 o'clock, Father E. J. Meyer conducting the services. Interment will be at Holy Cross cemetery.

Mrs. Kaether was born at Honey Creek, in Sauk county, and was a resident of Madison for 35 years. She is survived by four daughters, Marie, Helen, Anna. Celia; three sons, William, Joseph, John; two grandchildren; one brother, John Natterman, Baraboo, and four sisters, Mrs. Charles Hollatz, Madison, Mrs. Mary Felix, Mrs. Frances Hoppman, Prairie du Sac, and Mrs. Margaret Calfish, Simpson, Minn.

Hobart Bosworth Burned Severely While Acting

SAN MATEO, Calif.—Hobart Bosworth, actor, while being "burned at the stake" in a film production, suffered painful burns about face and hands.

Publisher Is Called By Death

Viscount Northcliffe, Hailed As Greatest English Publicist, Dies

(By the Associated Press)

LONDON — Viscount Northcliffe, noted British publicist died today.

The death of no other unofficial person could have made a deeper impression in England than that of Lord Northcliffe. The news was not a surprise as the bulletins issued by the doctors for the last week plainly indicated that their patient was dying.

Nord Northcliffe was by far the most noted figure in British journalism, and the first question on every one's lips was as to what effect his death will have on the policies of the Times and his other newspapers, which since the end of the war have strongly opposed the Lloyd George administration and its principles, with the notable exception of its dealings with Ireland, which the Northcliffe press supported throughout.

It was stated the cause of Lord Northcliffe's death was the production of pus within the heart which was followed by acute blood poisoning.

Lord Northcliffe will be buried Thursday in the St. Mary-Le-Bow cemetery Finchley. The funeral service will be held in Westminster Abbey.

Troops Return

Madison Cavalrymen Return Today From Camp Douglas

The 150 Madison officers and men who have undergone rigorous field training as members of the Service company, First Wisconsin Infantry, and the cavalry troop return today one stride ahead in military development. The men left camp at 9:30 this morning and arrived in Madison this noon. Armory quarters will be put in order and equipment checked during the afternoon. All will be officially dismissed Monday evening upon completion of the work at the armory.

Madison May Get State Elk Convention

Madison may get the 1923 Elks convention, it was learned this afternoon at the local lodge. The delegates to the state convention whic his to be held in Beloit this month will decide tonight whether or not they will bid for the convention.

The Elks convention would bring several thousand Elks to this city from all over the state.

Man Smothered When Wet Clay Wall Falls

CHICAGO—A wet clay cave-in in the basement of the new Illinois Trust & Merchants Loan bank building smothered one man to death and injured two others.

Douglas Fairbanks Is Pinched For Speeding

POMONA, Calif.—Douglas Fairbanks was arrested here for speeding. His wife, Mary Pickford, was with him at the time.

Montgomery Ward Co. Deny Merger Rumor

CHICAGO—Reports of merger of Montgomery Ward & Co. with another mail order house were denied by Theodore F. Mersles, president of the company.

Hearing of Eau Claire Strikers At Superior

Continued hearing of the seven striking railway employes of the Omaha road arrested at Altoona, Wis., will be held at Superior Aug. 28. The men were brought before Judge C. Z. Luse in U. S. District court here late Saturday afternoon. Upon motion of Attorneys Phillip La Follette for the men, and C. E. Blake for the company, Judge Luse consented to set the date of the hearing for Superior Aug. 28. The men were arrested charged with contempt of court. It being alleged that they fired at bunk cars of the Omaha road. Bail was fixed at $500 each, in default of which they will be held at the Dane county jail.

"Germany Over All" Is Accepted As Song

—BERLIN—"Deutschland Uber Alles" comes back as Germany's national song. President Ebert declared the song "a rallying cry for all defenders of the new Germany."

OCONTO—Peter Antone Rasmussen, 64 years old, a pioneer merchant here, died after a long illness.

Lord Northcliffe Famous British Publicist, Dead

Lord Northcliffe.

Brother of Lake Mills Woman Murders Wife

W. L. Palm, Denver, Slays Wife In Bath Tub; Then Kills Self

(By the Associated Press)

DENVER, Colo. — William L. Palm, well known Denver attorney, killed his wife Judia, and then police believe turned the gun upon himself and ended his life at his home here today. Mrs. Palm was killed in a bath tub. Palm left a note addressed to his sister, Mrs. C. F. Greenwood, Lake Mills, Wis. saying that because of ill health health life had become unbearable and he had "decided to take a chance with his wife in the happy life beyond."

Palm had lived here for many years and was instrumental, it is said, in securing a Carnegie Library for Denver.

Seize Garrison

Irish Republicans Seize National Garrison At Dundalk

(By the Associated Press)

BELFAST—A large force of republicans entered Dundalk at 3 o'clock this morning, taking the national garrison completely by surprise. The attack was successful and the town is now isolated with republican troops patrolling the streets.

The Anne st. police headquarters, which was occupied by the nationals, was the first objective to be stormed and taken. The garrison was captured.

The jail was the next to fall and prisoners who were mostly republicans, were liberated. These were supplied with arms, and joined their rescuers in the attack on the town in which bombs were freely used. The railway station and general postoffice were taken in succession.

Autoists Escape Injury In Smash On Atwood Ave.

Three automobiles figured in a smashup on Atwodo ave. early Sunday morning. Occupants escaped serious injury. License numbers of the automobiles were those of Louis Lindborg, Cottage Grove, Andrew Ohnstad, 321 N. Brearley st., and N. P. Black, Oregon.

Restaurant Blaze Caused By Crossed Wires

Crossed wires caused a $150 fire in the basement of Lawrence's restaurant, 602 State st., at 10 a. m. today. There were no patrons in the establishment at the time.

Famous Indian Trader Buried At Tomah

TOMAH, Wis.—Funeral services for Harry Lea, one of the best known Indian traders in the early days, was held here yesterday. Mr. Lea died at his home Thursday. Mr. Lea was probably one of the most influential white men in Indian councils of the Winnebago and in this section o fthe northwest.

MONROE—Seven children were left motherless in the death of Mrs. Samuel Kuentzie, 39 years old. She had been ill for a year of diabetes.

Can't Fill Priorities For State

Not A Car Of Badger Allotment Is Loaded; Shortage Is Acute

The Wisconsin fuel committee was informed today that not a car of coal had been loaded at mines to fill priority orders of the federal government.

This information was given by A. B. Uhrig, vice-president of the Milwaukee and Western Fuel Co., in answer to a query of the state committee, asking when it could count on receipt of 220,000 tons of fuel directed to Wisconsin.

"There is nothing we can do but wait," Edward Nordman, chairman of the committee said. "Without coal, dealers are unable to fill our priority orders."

The seriousness of the situation was said to be borne out by receipt of letters from docking companies, explaining that they would be glad to fill priority orders of the state committee just as soon as they had coal to ship. Their supplies are almost exhausted, they report.

A. R. Hirst, highway engineer, declared at the meeting today that Wisconsin's concrete road construction progress is being cut in half as a result of the strike. Cement companies unable to obtain coal cannot supply the state with the materials needed in highway building. The highway commission has had to cut down its force by 1,000 men, without others about to be laid off unless the situation clears up, Mr. Hirst said.

When the members of the committee gathered for their daily meeting they had no word concerning the location of 220,000 tons of coal consigned under priority orders of the federal government, to eastern Wisconsin docks. They decided to determine what steps had been taken to make this fuel immediately available.

John D. Morrisey, special fuel representative of Wisconsin, appointed Saturday by Gov. J. J. Baine, today was in Washington to watch the interests of this state involved in the activities of the national fuel administration. His first action will be to follow through the coal shipments already ordered.

6 Men, 1 Woman In Court On Liquor Charge

Six men and one woman appeared in Junior Superior court today on liquor charges. Two were ordered held for trial after preliminary hearings, while three men and the woman pleaded not guilty and had their cases continued. One man waived hearing. Mrs. John Grocomilli, R. C. Risley, George Nyborg and Ernest Titley denied the charges and bail was fixed at $500 each by Judge Stolen. Joseph and Peter Tropina were bound over for trial after prohibition agents described finding moonshine and mash on their premises several weeks ago. Joseph Reda waived hearing.

Annoys Women, Charge; Edward Fox Fined $25

After pleading guilty to disorderly conduct, Edward Fox, who was arrested by Patrolman Seifert Friday night on complaints that he had been following women on the East Side and claiming that he was a prohibition agent, was fined $25 by Judge O. A. Stolen in Junior Superior court today.

Jenson Fined For Having Cut Out Open

J. Jenson was fined $5 in Junior Superior court today when he pleaded guilty to driving his automobile with the muffler cut out.

Trains In South Are Held Up

Marooned Passengers Moved Out Of Desert; Violence Is Reported

(By the Associated Press)

CHICAGO — New knots in railroad transportation of the far west; bombing of a passenger train loaded with excursionists at Granton Junction, N. J.; dynamiting of Frisco railroad bridge at Ash Grove, Mo., and destruction by fire of the Wichita Falls and Northwestern railway shops at Wichita Falls, Tex., marked the early hours of the rail strike's seventh week, while rail heads and strike leaders were deadlocked over Pres. Harding's proposals for peace.

Santa Fe officials, moved marooned passengers out of the desert, but 19 trains on the system were still tied up when more crews quit.

The walkout of "Big Four" transportation brotherhood men, spread rapidly over the Southern Pacific system.

Crews left their trains at Sacramento and Roseville, Calif., and other points.

Relief for stranded passengers on the Union Pacific between Salt Lake City and Los Angeles, was given by brotherhood men, who moved six trains marooned at desert points to places of less discomfort.

Western Pacific crews working between Elko, Nev., and Gerlach agreed to return to work, but brotherhood men at Stockton, Oakland and Oroville, Calif., remained out.

Several trains which started on their schedules were forced to return to their starting points when it was evident they would only add to the tie-up in the deserts.

Endres Escapes

Coach Endres Is Near Injury When Launch Burns At Camp

The Camp Tichora launch was badly damaged by fire and Coach Otto Endres, camp counsellor narrowly escaped injury when the boat caught fire yesterday noon. The Y. W. C. A. girls that are in camp at Tichora were all on the bank and none of them were near enough to be injured. The boat was sunk by Coach Endres to save it from being entirely destroyed.

Loses Left Eye When Struck By Golf Ball

CHICAGO——W. L. Kratz, treasurer and director of Old Ben Coal Corporation, lost his left eye as result of being struck with a golf ball while on the links.

Can't Joke About Dry Law On Vodvil Circuit

NEW YORK—Prohibition cannot be referred to either humorously or seriously, in any of the theatres of the Keith Vaudeville circuit. It was declared also the ban would e effective on the affiliated B. S. Moss and Proctor circuits. A similar order has been in effect on the Orpheum, circuit, one of the largest in the west, for some time.

Many Attend Roxana Picnic At Monona Park

The Roxana picnic held at Monona park, Saturday, drew an attendance of over 50 members of the organization. The afternoon was spent in athletic contests with a picnic supper to close the day. Winners in the athletic contests were: women's 50 yard dash, Miss Balderson, first, bushel of peaches from Universal grocery; Miss Gladys McGowan, second, $2 credit at Madison Pastry and Catering Co.; human wheelbarrow race, William Balderson, and Leo Blied, a French Flasher from French Battery and auto mirror from McGowan Co.; obstacle race, Willis Erd, large French Flasher; childrens' 25 yd. dash, 4 year old Joe Ripp, box of Teckemeyer's candy.

Seven Gamblers Pay Ante of $25 in Court and Sweeten Pot With $4.90; Stolen Banker

Seven devotees of the green baize, the clinking chips and the smooth-sliding card whose game was rudely interrupted when Capt. Harry Davenport, with three policemen, insisted on joining the party on the third floor of a building on S. Pinckney st., on the capitol square, late Saturday night, continued their session in junior superior court this morning, with Judge O. A. Stolen as "banker."

"It was only a small game, judge," pleaded the players, after admitting taking part in the game.

"Then the ante is hereby raised to $25," answered Judge Stolen, "and you can each 'sweeten' the pot with $4.90 costs."

Robert Gerling, who pleaded guilty to operating the game, was fined $150 and costs.

The other men who were fined gave their names as Art Nordness, Thomas Anderson, Henry Fadness, William McKo[illegible], Andy Thompson and E. R. Williams.

Decks of cards, sets of dice, a table and chips were seized by the raiding squad, and taken to the police station. Officers Sefland, Funnel and Castle took part in the raid.

Matthew Slichta, at first charged with conducting the establishment, was discharged by the court, when Gerling admitted being in charge of the place when it was raided.

"THE GIFT OF ABNER GRICE," By ROBERT BARR Begins Today In The Capital Times

Campaign Schedule Is Heavy

Blaine Talks In Dodge Co.; La Follette Starts In Baraboo

Wisconsin political office holders out for re-election, candidates for state offices, and their campaigners started out again today on their campaign tours with but three weeks left in which to do their campaigning until primary day, Sept. 5.

All candidates were jubilant at the turnout of audiences throughout the state last week, despite the cool damp weather which greeted the campaigners. Several of the candidates reported making speeches in the rain, and Atty. Gen. William J. Morgan, candidate for governor, was forced to cancel his dates Friday on account of a heavy cold contracted while speaking during a rain.

Gov. John J. Blaine, who canceled the majority of his speaking engagements last week, to take personal charge of the Wisconsin coal situation, again started his campaign tour today with addresses in Dodge county. He was scheduled to make addresses in Reeseville, Juneau, Horicon, Fox Lake, and Beaver Dam. On Tuesday, the executive is to make but two speeches in Fond du Lac county, visiting Waupun in the afternoon and Ripon in the early evening. Governor Blaine will visit Washington county, Wednesday, Aug. 16, speaking in Campbellsport, Kewaskum, West Bend, and Hartford.

Coming from Washington county on Thursday, Gov. Blaine will tour the lake short Ozaukee county, making addresses in Jackson and Port Washington and then going to Sheboygan, for an evening address. Friday, Aug. 18 the governor will tour Manitowoc county, making an address at the Plymouth fair in the morning and following with addresses in New Holstein, Two Rivers and Manitowoc. On Saturday he will visit Winnebago county with a shop meeting talk at noon in Oshkosh. Then going to Omro he will make an address there and at Winchester, returning to Oshkosh for another address in the evening.

The governor will wind up his week's campaign tour with an address at an Italian picnic in Milwaukee county on Sunday.

Traveling together, Senator Robert M. La Follette, candidate for re-election to the senate, and Herman L. Ekern, candidate for attorney general on the progressive ticket, opened their tour with addresses in Baraboo and Portage today. On Tuesday the party will visit Mauston and Sparta, on Wednesday, Fountain City and Whitehall. On Thursday, Aug. 17, the senator and Mr. Ekern will go to Durand and Hudson for two scheduled addresses. On Friday, New Richmond and Menominee will be visited for two addresses. The pair will wind up the week's campaign in Chippewa Falls and Eau Claire, Saturday.

The itinerary of Mrs. Robert M. La Follette and Mrs. John J. Blaine wives of the senator and governor, started Monday with addresses in McFarland, Utica, Rockdale and Cambridge. On Tuesday, Aug. 15, they are to visit Jefferson county with addresses in Lake Mills, Johnson Creek, and Rome. On Wednesday addresses are scheduled in Waukesha county. The women campaigners are scheduled to make a morning speech in Morton, a noon address in Menominee Falls, two afternoon addresses in Pewaukee and Hartland, and an evening address in Oconomowoc.

Winding up their stump tour on **Thursday, Aug. 17,** the women are to make four addresses in Waukasha county. A morning meeting in Dousman and a noon meeting in Eagle is to be followed by two evening addresses in Mukwanego and Waukesha.

An addition to the Progressive Republican cause was added with the opening of a campaign tour today by Miss Gena Thompson, of the Woman's Progressive association of Madison and Mrs. Helen Roy Greeley of New York. Mrs. Greeley and Miss Thompson, who is a sister of the late Jim Thompson, strong La Follette supporter, will open their stump speaking tour on Monday, with addresses in Athens and Wausau. On Tuesday, the pair will travel to Portage county and make addresses in Mosinee and Stevens Point. Wednesday, starting with a morning meeting, the women campaigners will make four speeches in Amherst, Waupaca, Manawa and Iola. On Thursday Aug. 17 they will visit Symco, Marion, Clintonville and New London. Friday four addresses are scheduled, one in Hortonville, Schiocton, Black Creek and ending with an evening address in Appleton.

Winding up their tour Saturday they will make addresses in Kaukauna at 11:00 in the morning and in Two Rivers at 8 in the evening.

Fred Zimmerman and Sol Levitan, candidates for secretary of state and treasurer, respectively, on the Progressive Republican ticket, started their campaign this week in Evansville with an evening meeting. On Tuesday, August 15, they are to visit Orfordville, Footville, Edgerton, winding up with an evening meeting in Milton Junction. The remainder of their itinerary has not been arranged.

Martin Paulsen, former soldier and candidate for secretary of state, will open his week's tour on Monday, Aug. 14, with addresses in Portage, Endeavor and Oxford. On Tuesday he will speak in Westfield, Coloma, Hancock, Plainfield, and then return to his home city, Stevens Point, for an address.

Wednesday, Aug. 16, Mr. Paulsen will visit Pittsville, Port Edwards, and Nekoosa. Thursday he is scheduled for Necedah, New Lisbon and Mauston; Friday, Aug. 18, at Elroy, Camp Douglas, Tomah and Sparta. Mr. Paulsen will end his campaign tour in Dane county on Saturday.

Strong, direct sunlight is a powedful disinfectant.

Warm Today? Not In The Mountains!

Left to right, Francis Carl Massin, Brandon, Manitoba; Louis Straus, San Francisco; Edouard Feuz, standing, Swiss guide; Robert L. Wiel, New York; Miss Eleanita Rawlings, Piedmont, Cal.; G. S. Bell, Chicago, and Mrs. Massin, and Edwin F. Montell, New York.

August Bush, Who Started U.S. Ship Liquor Controversy, Finds Boats Are Really Wet

(By the Associated Press)

NEW YORK— August A. Bush, St. Louis brewer, who recently started a controversy with his charges that the government while seeking to enforce prohibition on land openly permitted the sale of liquors on shipping board boats, returned from Europe yesterday, claiming to have ample first hand evidence of his charges. He returned on the George Washington, allocated by the United States Shipping Board, to the United States lines, declaring that "there was much drinking of liquor on the trip just ended."

Nebraska Lieutenant Governor, Broke, Is Working As Strike Guard On Road For $5.00 Per

LINCOLN, Neb.—Pelham A. Barrows, lieutenant governor of Nebraska, and for the past week acting chief executive during the absence of Gov. Mc Kelvie, is working as a $5 a day strike guard for the Chicago, Burlington and Quincy railroad." Being lieutenant governor has honor but no remuneration," he said. "I took the new work when he and Mrs. Barrows found "we had $3.40 in the bank and I had $1.60 in my pocket, with not another cent in the world. Mr. Barrows is a former national commander of the Sons of veterans.

Big Mississippi Delegation to be in Madison

100 Boosters Will Arrive Here Today From Racine

RACINE, Wis.—"If we were to discontinue our trip right now we have already gained enough information ad have received enough suggestions which will more than repay us for having come nito the corn belt and dairy district," said J. R. Manser, secretary of the chamber of commerce of Columbus, Miss. just after the Mississippi farmers' booster special train of four Pullmans and a baggage car had pulled into the Northwestern station. There were 100 members in the party which was made up principally of farmers.

They were met at the depot by a delegation of Racine citizens including William Horlick, Sir William Horlick, Jr., Secty. Bartlett of the Association of Commerce and others.

After luncheon the delegates were taken to the station ad continued their trip.

The next stop on the itinerary is at Madison.

Big Tobacco PoolComplete By August 15

Organization Work Will Be Completed; Control 80% Of Crop

Formation of the largest tobacco pool ever attempted in Wisconsin, will be completed on Aug. 15, when directors of four sub-districts in the state meet here and elect officers and appoint a manager for the Northern Co-operative Tobacco pool.

The pool, which will control approximately 80 per cent of the tobacco grown in Wisconsin, was organized by tobacco growers from the state with the aid of the Wisconsin departments of markets and Aaron Sapiro, Calif., authority on co-operative marketing.

The object of this pool is to market the tobacco intelligently by forming a sales organization which will post crop conditions in a place of advantage, which the grower can obtain. The pool was also formed to get a more uniform pice for the tobacco by contrlling a greater prtion of the weed grown.

Read Capital Times Want Ads.

MARILYNN IS MARRIED AND ZIEGFELDS ARE—OH, SO HAPPY, SO WHY BE WORRIED

Flo Ziegfeld and his wife, Billie Burke, photographed in their apartment after his return from Europe.

The Ziegfelds, Flo and Billie, are as snug as a bug in a rug in their New York apartment following Flo's return from Europe, hastened by reports that all was not well within the Ziegfeld household. But "Sally" Miller is now Mrs. Jack Pickford and the Ziegfelds are happy, so why worry.

Sauk City Will be Host to Thousands

Huge Bridge Over Wisconsin River To Be Dedicated At Homecoming

One of the greatest crowds that Sauk City ever entertained will be the guest of that city tomorrow and the remainder of the week at the homecoming and the dedication of the new bridge across the Wisconsin river.

Tuesday will be devoted to receiving guests and to a social and concert in the park. Wednesday the industrial and business men of the city will stage a parade. Wednesday afternoon the Union Giants and the Lancaster ball teams will entertain and compete for a $500 purse.

Thursday morning the industrial parade will be repeated and following the parade the new bridge will be dedicated. An all-day picnic will be held at the park. In the afternoon the Chicago Giants and the Oelwein, Ia., ball teams will play for another $500 purse.

Friday is to be Chicago-Milwaukee day. The new flagpole will be dedicated on this day. A picnic with addresses and singing will follow. A fire run ad water fight will feature the closing of the day. Saturday will be devoted to sight seeing, street carnivals and dancing.

State Senate Candidates Get Nonpartisan O. K.

THE list of candidates endorsed by the executive committee of the Nonpartisan League included the following for the state senate: District 11, O. J. Kinney, Superior; District 13, Herman Bilgrien, Iron Ridge! District 17, Oscar R. Olson, Blanchardville; District 19, Julius H. Denhardt, Neeenah; District 23, Herman J. Severson, Iowa; District 27, Geo. Studenmayer, Portage; District 29, C. B. Casperson, Frederick; District 31, Howard Teasdale, Sparta.

Japan Remains Close On Naval Limitations

TOKIO—Japan will not make formal move for exchange of ratifications between herself, United States and Great Britain of the naval limitations treaty signed at the Washington conference.

49 Miners Surrender After Miners' Battle

WELLSBURG, W. Va.—Forty-nine men wanted by authorities in connection with fight at Clifton Mines, July 17, surrendered.

Two Airmen Burned To Death In Crash

DAYTON—Lieut. Moriarity and William Stonebreaker, airmen, were burned to death Monday when the plane in which they were riding burst into flames and crashed to ground.

12,000 Workmen Join Fascisti; Unrest Prevalent

GENOA—Twelve thousand workmen of the port of Genoa have joined the Fascisti in past few days. Unrest still prevalent. One Fascisti was injured when radical workmen ambushed a party along a road.

Score Of Engines Lost In $500,000 R. R. Blaze

PORTLAND, Maine—Damage caused by fire at round house yesterday estimated by railroad officials to be $400,000. A score of locomotives were destroyed.

50,000 Strikers Are Punished For Actions

ROME—A decree was issued Monday punishing 50,000 rail men who participated in last general strike.

2 AVIATORS DEAD

CLEVELAND—Louis Yahn of Newark, N. J., aviators, were killed when their plant fell 200 feet.

Pres. Harding May Attend 32nd Reunion

Harding Invited To Attend Reunion By Col. G. E. Seaman

Col. Gilbert E. Seaman, Milwaukee, president of the 32nd Division Veterans' association, announced today that he had invited many prominent national officials to attend. Included among those expected to be present are: President Warren G. Harding, former Vice-President Marshall, President Burton of the University of Michigan, Governors Blaine and Grossbeck, A. J. Beveridge, Judge K. M. Landis, and Alvin M. Owsley, national director of the American Legion.

The big reunion here will have its climax on Aug. 29 when the vets will parade in the morning and attend the spectacular field day events at Camp Randall in the afternoon. It is expected that 25,000 people will witness these events.

This reunion is the largest gathering ever staged in Wisconsin's capital city and, in preparing for 10,000 men, as well as for 25,000 people attending the field day, no small task has fallen to the citizens' general committees, composed of some one hundred men and women who have divided themselves into 15 committees.

At the Association of Commerce many requests are being received for reservations for tickets for field day from those who expect to come to Madison and see the greatest military gathering ever assembled in this city.

"I am urging mayors of Wisconsin cities to have their people send in for tickets right now," said Mayor I. W. Kittleson, general chairman of the citizens' committee, "because we fear that we shall not be able to handle the field day attendance at the last moment. If we know in advance, ample seats can be provided."

Reunion Signs

Red Arrow Welcome Placards Distributed In Madison

Window signs welcoming members of the Thirty-second division to the Red Arrow reunion were placed on distribution today. Headquarters where householders and business men may obtain them free are:

Baillie Hedquist Clothing Co., 23 E. Main st.; Forbes-Meagher Music Co., 27 W. Main st.; Danielson-Mueller-Simpson Co., 23 S. Pinckney; Woldenberg Cloak Co., 32 E. Mifflin st., and Kroncke Hardware Co., 30 W. Mifflin st.

A total of 20,000 signs has been printed by the executive committee in charge of arrangements for the gathering. Every home, office and store will bear a welcome sign during the reunion, according to plans.

Automobile signs bearing the invitation "Jump in, Buddie, Ride with Me" will be ready for distribution in several days.

Pilgrim Church Opens After Being Repaired

The Pilgrim Congregational church reopened Sunday morning to remain open seven days a week for worship, after having been remodeled by members of the congregation Members of the Federation of Labor donated their services toward the repair of the church. Those who took part in the work were Fred McLain, John Butler, Sol Reis, officers in the federation, or the Labor Temple association, Harry Lang, Ben Stitgen, Marcus Johnson, Joseph Reed, Sid Lang and Louis Bridgman, members of the congregation, but not the federation, also did their share.

Japanese Begin Their Disarmament Program

TOKIO—A reduction in Japanese army has begun. Today 4,000 artillery men were disbanded. Several generals and other officers will also be retired.

Wealthy Lumberman Is Killed By Two Yeggs

MT. HOLLY, N. J.—William Giberson, wealthy lumberman, was shot and killed when two burglars entered his home early today. The yeggmen escaped with $300 in currency.

Fire Fighters Gather For International Meet

SAN FRANCISCO—Fire fighters of all corners of the globe gathered here today for convention of the Association of Fire Fighters.

$300,000 Fire Routs Indiana Business Section

SOUTH BEND, Ind.—Fire in the downtown business district caused damage of $300,000 here Monday. Many families were routed by the blaze.

Short Circuit Causes Main St. Auto Blaze

The automobile of Z. A. Utter was slightly damaged when it caught fire as a result of a short circuit while Utter was starting it on E. Main s. today. Firemen of No. 1 station extinguished the blaze.

Read Capital Times Want Ads.

Keep Your Refrigerator Sweet With

B-K

A boon to the housewife because a few drops in water purifies storage places, as refrigerators, cupboards, bread and cake boxes, ice chests or any similar place where food odors develop.

B-K also prevents moulds, banishes musty odors and helps to keep foods fresh longer.

Give B-K a trial and you will find that "Every Home Has a Hundred Uses."

AT ALL DRUG STORES

Mrs. La Follette Speaks To Old Dane County Friends Under Big Trees On Lawns

More than a hundred people gathered at the home of Mr. and Mrs. O. P. Sorenson at Marshall at 10:30 Saturday to hear Mrs. La Follette speak.

Mrs. Blaine was absent on account of illness.

It was an informal meeting. Mrs. La Follette stood under a fine old pine tree. She referred to the influence of women's vote on political meetings that were being held on the lawns and under the trees, in a neighborly fashion, men and women mutually interested, as they should be, in questions of government. Many of the senator's life long friends were present. One Civil war veteran, who had "always voted for "Bob," was present.

Not less than a hundred people made themselves comfortable at the beautiful farm home of Mr. and Mrs. Henry Febock, near London. The large lawn with its fine old trees, is used as a park by the people of the village. Mrs. La Follette spoke from the porch steps. Miss Anna Anderson presided. The meeting opened with the singing of America. At the close of the meeting the audience gave three cheers.

The streets of Deerfield were lined with Fords. There was a large audience of farm men and women surrounding the bandstand before 8 o'clock. Mrs. Anna Van Saut introduced Mrs. La Follette, who spoke for an hour and held the close attention of one of the largest outdoor evening meetings she has addressed so far.

Allen's Foot-Ease Does It

When shoes pinch or corns and bunions ache, get ALLEN'S FOOT-EASE, the antiseptic powder to be shaken into the shoes and sprinkled in the foot-bath. It takes the sting out of corns and bunions, Smarting, Aching Swollen feet, 1,5000,000 pounds of powder for the feet were used by our Army and Navy during the war.

Read Capital Times Want Ads.

What to Use and Avoid On Faces That Perspire

Skin, to be healthy, must breathe. It also must perspire—must expel, through the pores, its share of the body's waste material. Certain creams and powders clog the pores, interfering both with elimination and breathing, especially during the heated period. If more women understood this, there would be fewer self-ruined complexions. If they would use ordinary mercolized wax instead of cosmetics they would have healthy complexions. This remarkable substance actually absorbs a bad skin, also unclogging the pores. Result: The fresher, younger under-skin is permitted to breathe and to show itself. The exquisite new complexion gradually peeps out, one free from any appearance of artificiality.

Obtain an ounce of mercolized wax from your druggist and apply nightly like cold cream for a week or two, washing it off mornings. There's nothing better for an overred skin, tan, freckles, pimples or blotches.

W. C. T. U. Will Hold Meeting Tues. Afternoon

The regular meeting of the Willard W. C. T. U. will be held Tuesday afternoon, 3 o'clock, at the home of Mrs. C. M. Johnson, 3[illegible] W. Johnson street. The meeting will be held Tuesday rather than Wednesday because of the Dane county convention of the W. C. T. U.

CHIROPRACTIC TALKS

KIDNEY TROUBLE has caused untold HUMAN SUFFERING

PAINS in the back are symptoms you should not allow to continue unheeded. Kidney troubles are dangerous when they reach final stages. Chiropractic adjustments will correct the cause of your trouble, and health will follow as naturally as water will flow when the obstacle that holds it back is removed.

H. J. Steve,
CHIROPRACTOR
Over Gamm Jewelry Co.
9 W. Main St. B. 3690
Mon., Wed., Fri. evenings
7 to 8 P. M.

THE STORE OF FRIENDLY SERVICE AT 22-24 NORTH CARROLL STREET

Karstens Great Work Clothing Week

Aug. 15th to 19th

In order to further introduce the extensive lines of work clothing handled in our great stocks, we are inaugurating something new for Madison, a "Work Clothing Week" during which we shall feature at special prices, all sorts of clothing for work at prices which are sure to appeal to the men of this community.

This great store was built, in a large share, for the men on the farms, in the factories, on the railroads and in the manufacturing plants, men who by the sweat of their brow as well as with their brain power create and develop the great necessities, we all must have.

A Big Feature Will Be A Special Line of

Hard Finish Hard Wearing Suits

New Fall models—well tailored—in a variety of styles and at exceptional prices. Many with two pairs of trousers.

$30 - $35 - $40

Special Displays will be made of Overalls, Work Shirts, Khaki Pants, and Work Pants of differern fabrics at special prices

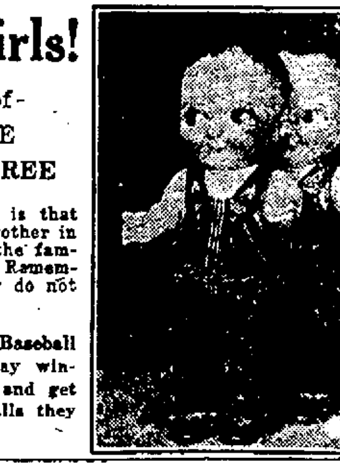
Special values in Shirts, Hosiery, Neckwear, and other furnishings—Shoes for men, women and children—and children's apparel.

Boys! Girls!

Get a Pair of BUDDY LEE OVERALLS—FREE

All that is necessary is that you bring "Dad" or Brother in to look at a pair of the famous LEE OVERALLS. Remember, just to look, they do not have to buy.

See the Buddy Lee Baseball teams in our display windows—and be sure and get a pair of the overalls they wear—FREE.



Karstens Features the Best—All Union Made—At Reasonable Prices

KARSTENS
"The Store of Friendly Service"
22-24 N. Carroll

THE BIGNEW STORE EVERY ONE'S TALKING ABOUT—COME THIS WEEK

:-: Social Events :-: Club News :-:

Church Dinner to be Feature of Labor Day

Ladies Of St. Bernard's To Stage Program And Contests

By MARJORIE CAPRON.

[illegible]hicken 'n gravey on hot biscuits, [illegible] of mashed potatoes and all [illegible]immings to the last cup of [illegible], every bit of it home cooked [illegible] ladies of St. Bernard's [illegible], 735 Atwood avenue, will be [illegible] at noon Labor day in the [illegible] auditorium. You are invit[illegible] come and bring the whole [illegible] and park the car in the [illegible]'s parking space, and let the [illegible] romp on the playground [illegible] dinner. Prizes and favors [illegible] be given to the lucky winners [illegible] contests in the afternoon [illegible]. And there will be a prize [illegible] the biggest family and the fat[illegible] man, and the tallest. Of course [illegible] will want to go home and [illegible] an evening meal after a day's [illegible] so the ladies of the church [illegible] going to serve a roast pork [illegible] that is every bit as delicious as the dinner.

Mrs. John H. Kernan is chairman of the Labor day activities, with Mrs. James Mackin, Mrs. Matthew Kopp, Mrs. Joseph Butler, Mrs. Matthew Figy, Mrs. Frank Statz, Mrs. Arthur Clermont; and Matthew Kuels, Paul Gundlach, Leo [illegible] cooperating to give a jolly [illegible] to those who attend.

* * *

WINS K. OF C. PRIZE

[illegible] first prize of $3,000 offered [illegible] Knights of Columbus contest [illegible] the best essay on an American [illegible] subject, was awarded to [illegible] Samuel Bemis, at the 40th supreme convention of the order, last week in Atlantic City. Prof Bemis, head of the department of history [illegible] Whitman Presbyterian college, Walla Walla, Wash., wrote on "Jay's Treaty," under the pen name Christopher Columbus, and neither the judges nor members of the historical commission were aware of [illegible] identity until a sealed envelope was publicly opened at the general [illegible] of the convention.

John Moran, 601 South Few [illegible], local delegate to the convention, returned Saturday. Accompanied by his wife, he spent [illegible] weeks in the east, visiting Washington, D. C., and New York [illegible].

* * *

VISIT AT ST. LOUIS

Prof. and Mrs. E. J. Graul and [illegible] S Lathrop street, are in St. Louis, Mo., for a few weeks visit [illegible] relatives.

* * *

SIX-THIRTY DINNER

[illegible] Mrs. Harry Oldenberg, [illegible] Main street, gave a 6:30 [illegible] a few evenings ago. [illegible] Misses Robert Bar[illegible] Mary Drinkhouse [illegible] Misses Rose Hill, Helen [illegible], Bessie Clough, Myrtle [illegible] and Doran Moran.

* * *

IN SWITZERLAND

Mrs. Henry Wantd, Milwaukee, has arrived in Switzerland and will [illegible] guest for some time of an [illegible] the Buenzli-Kronenberg ho[illegible]. Mrs. Wantd is a sister of August Buenzli, and formerly Miss Bertha Buenzli, of Madison.

* * *

CAWLEY GUEST

Miss Nellie Vaughn, Washington, [illegible] is expected to arrive Satur[illegible]. She will spend a month with [illegible], Mrs. J. J. Cawley, 507 [illegible] Wilson street. Mrs. Cawley [illegible] returning this evening from a [illegible] visit in Baraboo.

AT CHICAGO PAGEANT

[illegible] and Mrs. W. H. Collins, 704 [illegible] Gorham street, are attending [illegible] Chicago pageant. They motor[illegible] and are to continue their [illegible] to Detroit, Grand Rapids [illegible] island, returning aft[illegible].

* * *

HOME FROM ST. PAUL

[illegible] Murphy, 124 Breeze Ter[illegible] yesterday from St. [illegible] spent the early va[illegible]. As a guest of his [illegible], he was enter[illegible] and Forest [illegible]

* * *

VISITING IN HYLAND

[illegible], 317 West Day[illegible] of her moth[illegible], in Hyland, [illegible]

* * *

[illegible] GUEST

[illegible], nee [illegible] returning [illegible] way of [illegible] of her [illegible] with [illegible] short time. [illegible] Mrs. Fox has [illegible] brother[illegible] Mr. and Mrs. [illegible], formerly of Chi[illegible]

* * *

[illegible] TO MILWAUKEE

[illegible], 148 West Gor[illegible] to Milwaukee, [illegible] guests, Mr. [illegible] Wisconsin Rap[illegible] daughter, Miss [illegible] medical bacterio[illegible] hospital.

* * *

SON BORN

[illegible] Mrs. George Buergin, [illegible] street, announce the [illegible] at the Madi[illegible]

* * *

[illegible] Mrs. Joseph Dean, 636 [illegible] are back from [illegible]

[illegible] a motor trip [illegible] the Niagara [illegible] R. H. Stokes of [illegible] guests Friday [illegible] Mrs. Timothy Murphy, [illegible]. The Rev. J. [illegible] Congressional [illegible] was also a guest [illegible] Murphy [illegible]

Mr. and Mrs. Charles Cleveland, [illegible] S. Orchard street are spending [illegible] week in Milwaukee with rela[illegible]

Read Capital Times Want Ads.

Honored In Beauty Contest

Louise Dunlop.

Miss Louise Dundop, 1219 Mound st., who was the 1921 Mardi Gras queen, has been chosen as one of the five most beautiful girls in the county by an artist of the Metropolitan magazine. A full page picture of Miss Dunlop is carried in the September issue of the magazine.

Haskell Coffin, artist who conducted the contest, did so for the purpose of allowing the American public to pick its favorite type of beauty. A popular vote will be taken on the five entrants.

MRS. LACEY RETURNS

Mrs. J. T. Lacey, 501 North Henry street, a guest for many weeks of her son Randolph, Wauwatosa and of a daughted, Miss Lydia, Green Bay, is again at home. Miss Lydia, who is in charge of the state co-operative health laboratory, Green Bay, returned with her mother and will be here two months. A son, David, representing the James Manufacturing Co. of Ft. Atkinson, with headquarters in Akron, O., is coming home for the week end.

* * *

RETURN FROM MILWAUKEE

Harlow and Marion Nelson, 2101 Winnebago street, are returning Monday from Milwaukee, since the dismissal of school in June, they have been with an aunt, Mrs. Harvey Baxter.

* * *

WILL CAMP AT EAGE RIVER

Charles H. Deards, New York City, general manager for the J. Baun Safe and Lock Co., is returning East after a week with his parents, Mr. and Mrs. Edward Deards, 335 West Wilson street. A number of Chicago relatives of Mr. and Mrs. Deards, motoring north for three weeks at Eagle River and Birch Lake, are now their guests. The party includes Mr. and Mrs. C. C. Johnson and daughter, Miss Lavyrne; Miss Ruth Deards, Mrs. James Lamb Abernethy with her daughter, Miss Jane Anne, and son James Lamb Jr.

* * *

Theodore Brown, Nakoma, motored to Chicago for an over week-end visit with Dexter Brown, a 1922 graduate of the university.

* * *

Mrs. R. A. Meyrowitz has returned to New York city after visiting her uncle and aunt, Mr. and Mrs. A. M. Hilsenhoff, 1719 Monroe street. She was accompanied by her daughter, Miss Dorothy Meyrowitz, who spent five months at the Hilsenhoff home while her parents were in Europe.

* * *

SON BORN

A son was born to Mr. and Mrs. A. C. Kilgust, [illegible] Jenifer street, yesterday. Mrs. Kilgust was formerly Miss Esther Kalbfleisch of Madison.

* * *

Weddings

Thursday morning, September 14, will occur the wedding of Miss Cordelia-Frances L'Anglais, daughter of Mr. and Mrs. P. J. L'Anglais, 215 North Warren street, and Melvin Anderson, Tomah. Miss Agnes Anderson, Tomah, sister of the groom, is to be bridesmaid, and R. J. L'Anglais, Madison, brother of the bride, will be best man. A wedding breakfast is to be served at the home of the bride. Mr. Anderson and his bride will be at home at Antigo, where the groom is in business.

* * *

APFEL-CLARK WEDDING.

Miss Myrtle Mae Apfel, sister of Mrs. Charles Allen, Madison, and Charles P. Clark, Janesville, were recently married at the home of the bride's parents, Mr. and Mrs. John Apfel, in Evansville, by Rev. C. E. Coon. A dinner was served to immediate relatives. Mr. and Mrs. Clark left on a trip and will make their home in Janesville.

* * *

Announcement is made by D. E. Rice, 414 South Orchard street, of the approaching marriage of his daughter, Mrs. Gladys H. Scholtz, and James Meyer, Chicago. The wedding is to take place at 10 o'clock Monday morning, Aug. 21, in St. Raphael's church, Rev. T. B. Johnson reading the service. The bride will wear a gown of tan crepe Romaine, a black hat and a corsage bouquet of roses. She is to be attended by her sister, Mrs. Percy E. Weaver, and matron of honor, and the best man will be Elmer A. Rice, brother of the bride. A wedding luncheon is to be served at the Park hotel to members of the bridal party and immediate relatives. Mr. Meyer and his bride are to be at home after Sept. 1 at 6112 Winthrop street, Chicago. The groom is in the tailoring business.

* * *

Mr. and Mrs. W. H. Phillips, 1118 West Dayton street, announce the approaching marriage of their daughter, Miss Joy Rosemary Phillips and Ernest Wilhelm Nordgren, 1001 Regent street.

* * *

PERSONALS

Mr. and Mrs. Thomas A. Manchester, 1609 Regent street, are visiting in Richland Center, their former home.

* * *

Miss Elsie Seelow, 517 East Main street, returned a few days ago from a trip to Milwaukee, Chicago, Michigan City, Ind., Muskegon, Ludington and Detroit, Mich.

* * *

Mr. and Mrs. R. P. Longfield, 1614 Regent street, have had as their guest, Mrs. Longfield's cousin, Miss Veda Brimmer, Reedsburg.

* * *

Miss Sadie McCaughey, 405 Sommers avenue, is visiting her grandmother, Mrs. Essie McCaughey of Harvard, Ill.

* * *

Mr. and Mrs. C. R. Wacker, motored here during the past week from Detroit to visit Mr. and Mrs. A. L. Huegel, 2118 E. Washington, avenue.

* * *

Mrs. F. O. Weinman, 832 Jenifer street has returned from Reedsburg where she was a guest of her sister Mrs. Edward Williams.

SUIT SKIRT MADE OF NARROW BRAID

Fashion's newest development is this sports suit with its skirt made of narrow Ukranian braid and long, black coat trimmed with bands of the same braid. Wide sleeves and a stand-up collar are features of the coat.

Gullickson Is Named County E. F. U. Head

Stoughton Man Elected At Picnic Here; Madison People Honored

Valdemar Gullickson of Stoughton was elected president of the Dane county assembly of the E. F. U. at the annual picnic held at Monona park Sunday. About 400 members of the Madison and Dane county assemblies attended with their families. Sun Prairie was chosen as the scene of the next annual picnic of the E. F. U.

Officers elected were: Herbert Koch, Mount Vernon, vice president E. C. Story, Madison, secretary; Lincoln Sawyer, Sun Prairie, treasurer; Miss Loraine Felt, Madison, warden.

J. C. Karel, Milwaukee, supreme president of the organization, was the principal speaker of the day giving an address on the importance of carrying life insurance, especilly for heads of families. Mr. Karel stated that the E. F. U. is rated as the best fraternal organization. He was introduced by Norton J. Williams, member of the supreme board of trustees. Henry Noll, president of the day, gave an address of welcome to the county members urging their support be given to Richard O. Lewis, deputy for Dane county.

Bach's Juvenile orchestra rendered the musical program during the day.

The feature of the athletic games during the afternoon was the base ball game beween the county team and the Madison assembly team, which ended 20 to 4 in favor of the county. The Madison team was composed of Richard. Conway, Story, Krug, Johnson, Lewis, Mayer Williams, Tandvig, and Zwank. The county positions were played by Erfurth, Oleson, Bull, Gurst, Pettijohn, C. Rademacher, Sheei, R. Rademacher, Gullickson, J. Oleson.

The tug of war was won by the Madison team, after which the winners of the contest were challenged by a Mount Vernon team which reaped the laurels, defeating Madison.

The races and winners were as follows: Boys under 14, Ralph Sarbacher, Black Earth, first; R. Egger, Madison, second; boys over 14, T. Kennedy, Madison, first; R. Schumacher, Madison, second; girls under 14, Gertrude Erick, first, Madison; H. Smith, Madison, second girl over 14, L. Clements, first; G. Smith, second; slipper race, Miss F. Berth, first; Miss Conrad, second fat man's race, Clinton Archer, first; Charles Wieseman, second. Marcella Peterson took first and Mrs. Harry Zwank took second in the ball throwing contest for ladies.

* * *

Mrs. Emil Seiler, 911 Jenifer street, was a guest of her son, Dr. Truman Seiler of Neenah, for the past three weeks. She also visited her daughter, Mrs. Henry Krueger while there.

* * *

Clubs—Organizations

Mrs. Herman Platt will be hostess to the Young Woman's Guild of Plymouth Congregational church Thursday afternoon at 3 o'clock in the church.

* * *

The Women's Guild of the Luther Memorial church will meet in the church parlors Wednesday afternoon at 2:30. Mrs. F. G. Boyles, Mrs. Harry Albrecht, and Miss Sophie King will be hostesses.

Cycle Somersaults 4 Times; Driver Unhurt

MILWAUKEE, Wis.—John Seymour, 24, Escanaba, Mich., escaped death late yesterday when his motorcycle somersaulted four times and threw him into the center of the track at the fair grounds, where he was practicing for the national championships Sunday.

Harvest Hands Scarce In Western Districts

MITCHELL, S. D.—Harvest hands are scarce in this section and harvesting of crops is an acute problem.

Soviets Attempt To Open Chinese Trade

PEKING—M. Joffe, envoy of the soviet government of Moscow, arrived here today to open trade and other negotiations with the Chinese government.

Ald. Behrend Assumes Post Of Acting Mayor

Jacob Behrend, president of the common council, took up his duties this morning as acting mayor in the absence of Mayor I. Milo Kittleson, who left Saturday for an auto tour through the northern part of the state.

MISS DEVINE LEAVES.

Miss Katherine Devine, daughter of Postmaster W. A. Devine, left the city Saturday for a two weeks' visit with her sister, Mrs. Noel, at Dubuque, Iowa.

Excess Fat Is caused by disturbed metabolism, due to interference with power of conduction of the nerves which govern the metabolic processes in the organism.
Spinal adjustments correct the abnormal condition.
W. G. Hovey, Chiropractor
Pioneer Block
Office B.-1015
Res. B.-6202

Women May Decide Vote InMississippi

Three Candidates Seek Toga Of Sen. Williams; One Is Woman

(By the Associated Press)

JACKSON, Miss. — Mississippi's democratic primary Tuesday brings to a close one of the most sharply contested campaigns of recent years among the three candidates seeking nomination for the seat being vacated by John Sharp Williams in the U. S. Senate. Nomination is equivalent to election.

Former Cong. Hubert Stephens, of New Albany, former U. S. Senator James K. Vardaman, of Jackson, and Miss Belle Kearney, of Flora, as candidates for the senatorial toga, having each contributed largely to the interest. According to observers, each will poll a large vote in Tuesday's contest, and while headquarters of all three candidates express entire confidence in the outcome in last minute announcements, it is geerally conceded that none of the three will have a walkaway.

The women's vote may be a deciding factor in the contest. The uncertainty as to the trend of the feminine vote closely coincides with the uncertainty that prevails as to the probable outcome of the candidacy of Miss Kearney. If she should poll as many as 25,000 votes a second primary will be necessary. Mr. Vardaman personally has taken no active part in the campaign.

Former President Woodrow Wilson's letter declaring Mr. Vardaman to be "wholly false and untrustworthy," and expresisng the hope that he will not be again sent to the U. S. senate has not been used by Mr. Stephens in his campaign speeches.

Gasoline Drops 3 Cents Since Gil Started His Job

Gilbert C. Roe.

The price of gasoline has dropped three cents since the investigation of the senate committee has been started. The investigation was started under a resolution passed in the senate, which was introduced by Senator La Follette. Gilbert E. Roe, a New York lawyer and a former partner of Senator La Follette, is conducting the investigation.

Body of Chao Shipped Back To Homeland

Body Of Drowned Student To Be Shipped At Father's Request

The body of Yuan Fu Chao, Chinese student who was drowned in Lake Mendota last month, will be shipped back to China within a few days, in response to a cablegram from his father, General Chao at Shansi, China. Chinese students who are attending the university here have made the arrangements with the Gill undertakers to prepare the body for its long journey overseas.

No man, with horse sense, will eat like a horse.

Quality and Reliability
—is bringing men and women to this cafeteria in ever increasing numbers.
The Two Best Places To Eat
Home & Cop's Cafe

BARABOO—The Rev. Gerhard Pieper, Cambria, will be pastor of the Lutheran church here, succeeding the Rev. H. Mueller, who died this summer.

Big Sacrifice Sale
Wednesday
Thursday
Friday
Saturday
4 Days Only
All Prices Radically Reduced
Hinrichs Dry Goods Company
204 E. Main Street

Buy Your ELECTRICAL Goods
At An ELECTRICAL Store
And Get ELECTRICAL Service
Associated Electrical Contractors-Dealers
Cirvis Elec. Co.
Blackhawk Elec. Co.
Suburban Elec. Co.
Harloff-Loprich Elec. Co.
Electrical Supply Co.
Schaub-Bradford Elec. Co.
E. E. Sater
Nickles' Elec. Shop
Endres Elec. Co.
Electrical Merchandising Co.

A SWEEPING SALE OF ALL SURPLUS STOCKS

State St. Leader DRY GOODS
Cor. State and Gilman

Fruit of the Loom Muslin
Fruit of the Loom Muslin, 36 inches wide, nationally known as the best Muslin obtainable. Surplus stock sale, yd. ---- 18c
10% discount on all other sheetings.

Pure Linen Handkerchiefs
Ladies' Pure Linen Handkerchiefs, would be a bargain at 20c, sweeping sale price ---- 10c
20% discount on all other fancy handkerchiefs.

Closing Out the Last of Our Spring Coats and Suits
LADIES' SUITS
$8.95 for Ladies' all wool Jersey Suits in tan and heather shades in sizes to 42. Values to $16.50.
$16.00 for ladies' suits in poiret twill, homespun and tweeds in navy, tan and brown, values to $40.00.
$25.00 for ladies' suits in poiret twills, tricotine, etc. Values to $50.00.
LADIES' COATS
$3.95 for a small lot of wool coats in long or short models. Formerly sold to $15.00.
$13.95 for all wool herringbone twill, mannish models, very desirable. Formerly sold to $27.00.
$19.50 for a small lot of coats the best in our store. Formerly $50.00.
50% discount on all others.

Household Goods
at prices that will not be repeated again
Linen Toweling
One half Linen Crash Toweling, unbleached, suitable for kitchen use. Worth yd., 25c. Surplus Stock Sale, yd. ---- 15c
Table Linen
A splendid quality of Mercerized Damask formerly sold to yard, 69c. Surplus Stock Price, yd. ---- 49c
Pure Linen Damask, 72 inches wide. A splendid quality fully worth $3.50. Surplus stock price, yd. $2.25
Comforters
A Silkoline Comforter, full size for double bed. Scroll stitched both sides. Floral patterns. Surplus Stock Price ---- $2.95
Pillow Cases
Ready made Pillow Cases, 42 or 45 inch free from dressing fully worth 35c. Surplus Stock Price ---- 25c
Comfort Bats
Full sized Comfort Bats 72x90 in., regular $1.00 value. Surplus Stock Price ---- 75c

Yard Goods
Down to the Lowest Possible Level
Batiste Voiles and Organdies
A splendid selection of Summer Goods. 40 inches wide. Suitable for immediate wear. values to yard, 95c. Closing out Price, yard ---- 39c
Cotton Poplins and Dress Ginghams
Highly Mercerized Poplin in good range of colors, values to 50c yd. Splendid patterns in Ginghams reduced to yard ---- 19c
Percale and Apron Checks
Yard wide Percale and best quality 27 inch Gingham, staple checks. Reduced for Surplus Stock Sale, yd. ---- 12c
Curtain Materials at Factory Prices
Marquisette or Scrim
36 inch Marquisette in excellent fine quality, comes in white, ivory or ecru suitable for your best room. Surplus Stock Sale Price, yd. ---- 15c
Sunfast Curtain Materials
A splendid quality of Sunfast Curtain material in the much wanted shades brown, green, rose and blue. Surplus Stock Sale Price, yd. ---- 75c
Cretonnes
A splendid lot of yard wide Cretonnes, an exceptional lot of pretty patterns, values to yd., 49c. Surplus Stock Price, yd. ---- 25c

Small Lots of Odds and Ends
That will pay you to come in a hurry
Ladies' Hosiery
15c for lot of Ladies' Black Cotton Hose worth to 30c.
39c for lot of Ladies' Black Silk Hose. All perfects, formerly sold to 98c.
Knit Underwear
12½c for Ladies' Gauze Vests regularly sell for 20c.
35c for Ladies' shell knee Union Suits in sizes 34 to 44. Regular 60c value.
Voile Smocks
49c for odd Lot of Voile Smocks or Blouses, former price to $3.00.
Tailored Blouses
$1.25 for a lot of fine tailored Blouses in plain white or trimmed with gingham collar and cuffs, values to $4.50.
Bandeaux
19c for pink mesh back closing bandeaux brassier with elastic insert. Regular 39c value.
Children's Dresses
49c for Children's Gingham Dresses in ages 6 to 12. Values to $3.50.

Still Good Picking!!!
in our assortment of
Summer Dresses
One lot of high grade Gingham dresses, Organdy or Pique trim, suitable for street wear. This Spring's styles, surplus stock price ---- $2.95
Organdy or Dotted Swiss dresses radically reduced. A splendid assortment in all desirable shades. This season's styles, values to $20.00. Surplus stock price $5.75
Silk dresses upward of ---- $5.00

WHAT MAKES BILL WILD? CREAM PUFFS!

BAD MAN OF MOVIES NOT SO DOCILE SAYS YOUNG BRIDE

Upper left, Blanche Sweet; lower left, Gloria Swanson; "Wild Bill" Hart and his wife, Winnie Westover, and, inset, Marshall Neilan.

LOS ANGELES—Since way back when the Nile bathers cavorted in the bullrushes and talkative Egyptian wives were locked in the Sphinx instead of being awarded alimony a weighty problem has puzzled scientists and savants.

In fact no one has been able to come close to finding out just what makes the wildcat wild until it leaked out here.

Whatsit? Why, nothing more or less, and little of that, than cream puffs.

For out here where the west is west and a man is supposed to be known by his worth, William S. Hart, "Wild Bill," was known as the rearing, tearing, rushing, crushing, hooting, shooting bad man of the plain—at least in the movies.

No one was ever quite able to tell just what brought to "Wild Bill" his nth degree of wildness—that is until one Winnie Westover answered the age-old question.

Winnie is really Mrs. William H. "Wild Bill" Hart and has been for somewhat less than a twelvemonth.

Bill used to be quite gentle, his appearances on the screen to the contrary notwithstanding. At least Winnie thought so when she led him, docile, to the altar.

Shortly thereafter, according to her own statement, and here's where the secret came out, she started calling "Wild Bill" the wildcat, "Cream Puff."'

And shortly thereafter the wildcat got wild—no, no not wild, wilder.

In fact he got so wild, according to Winnie, that they just had to separate. And separated they will remain either until the effects of the cream puffs wear off or until an august court formally tells them to pursue different paths together.

Then just to keep "Wild Bill" from monopolizing all the notoriety out comes the information that Marshall Neilan, who never was quite as wild—in the films—as Hart, and his bride of weeks, Blanche Sweet, have practically agreed to disagree on mutual menus at mealtime.

Gloria Swanson already has passed through the same mill and though she promised the judge that she wouldn't marry again she didn't promise to keep out of the limelight. Consequently Gloria stepped out recently and denied that she practiced her celebrating vamping qualities on her late father-in-law who lacked all the cream puffian wildness of "Wild Bill."

Visiting Celebrities Prove Southern States World's Champion Publicity Getters

Mary Margaret McBride, Noted Interviewer, Says All Famous Visitors Ask for Dixie

NEW YORK CITY—It makes no difference whether it's an immigrant unable to speak a word of English or a dignitary with half a dozen languages at his tongue's tip, after the visitor to this country has seen the Statue of Liberty and the Woolworth Tower, he always wants to know the whereabouts of "way down south in Dixie."

This is the discovery of Mary Margaret McBride, feature writer for the New York Evening Mail and other eastern publications whose daily business is the interviewing of celebrities.

"Invariably foreigners seem to have heard more about the south than any other section of the United States except New York," she declares.

South Arouses Curiosity

"I remember having tea at the Ritz with Mrs. W. L. George, just after the famous English writer brought his pretty bride here last winter. Mrs. George was trying, as she frankly admitted, 'to find out everything about America' and she asked bushels of questions.

"'Oh, I know I'll adore your south,' she said finally. 'It's so romantic!'

"Others who have asked eagerly about Dixie were Mrs. Muriel MacSwiney, widow of the late Lord Mayor of Ireland, Madame Marie Curie, of France, discoverer of radium and the other day, Frau Georg Michaelis, wife of the former chancellor to the German Kaiser.

"Even Margot Asquith, for all her show of superiority, looked almost interested when Kentucky and Virginia were mentioned.

Lady Astor Solves Problem

"Since I'm from Paris, Missouri, myself, I always take the tributes to the south as a sort of personal compliment but I was never able to figure out how people found out so much about that section until lovely Lady Astor, a Virginian transplanted to England came over not long ago.

"She said Dixie owed its fame to the song writers and ballad singers who press agent it continually. And when you think it over you see she's undoubtedly right.

Georgia Played 'Round the World

"Nearly every phonograph in the world plays the modern fox trot 'Georgia,' with its famous lines:

'You put the sweet
 In Home Sweet Home,
My own sweet Georgia.'

and every college quartette anywhere undoubtedly sings 'My Old Kentucky Home' and 'Dixie.' As for 'Swanee River,' missionaries find that savages use its tune for a war dance!

"They may call the south slow but they can't say she doesn't lead the country in getting free and effective publicity for herself!"

Sisler Still Holds Lead For Bat Honors

CHICAGO — The race for batting honors of the American league between Ty Cobb an George Sisler grew closer on Sunday. Sisler, however, continues in the lead with an average of .411, while the mark of the Georgia peach is .408. Sisler made only one hit in four times at bat on Sunday, while Cobb was at bat three times and poled one hit. Their marks Sunday night follow:

	Games	AB.	H.	Pct.
Sisler	103	421	173	.411
Cobb	98	382	156	.408

Dempsey And Brennan Prepare For Battle

CHICAGO — Jack Kearns, manager of Jack Dempsey, white heavyweight champion, who will defend his title against Bill Brennan of Chicago in Floyd Fitzsimmons' bowl at Michigan City Labor day afternoon, came into Chicago last night to meet the champion, who will arrive from Boston early this morning.

Following the arrival of Kearns and Fitzsimmons was that of Leo Flynn, maanger of Brennan, who came on a day in advance because he was afraid the railroad strike might hold him up.

Read Capital Times Want Ads.

Sarazen, Defeated By Hagen And Kirkwood

ROME, N. Y.—Walker Hagen, British open golf champion, and Joe Kirkwood, Australian star, defeated Gene Sarazen, American open title holder, and Harold Callaway, local professional, 3 and 2, in an 18 hole exhibition match.

Babe Ruth In Bed With Abscess On Leg

NEW YORK—The Yankees will have to worry along without Babe Ruth for several days. He went to St. Vincent's hospital Saturday for an operation on an abscess on the calf of his right leg, then was sent home to his apartment in the Hotel Ansonia. Ruth's infection is almost identifally the same as the abscess which developed on his arm during the world's series last fall. Ruth may miss the entire Detroit series.

Molla Takes Title In Cove Tennis Meet

GLENCOVE, N. Y.—Mrs. Molla Bjurstedt Mallory, national woman's tennis champion, retained the Metropolitan singles title, defeating Mrs. Marion Zinderstein Jessup, Wilmington, Del., in the final round on the courts of the Nassau Country club, 6—2, 6—2.

Read Capital Times Want Ads.

INDIANA STARTS OPERATING MINES AS TROOPS GUARD

Above, motor transport train ready to leave for Staunton, Ind. Insert, Captain Edwin C. all, Indianapolis. Below, Major Axtell and aide leaving Indiana statehouse on way to mine fields.

The state of Indiana has gone into the coal production business at the order of Gov. McCray. With a guard of 800 troops, martial law declared, McCray re-opened two strip mines at Staunton in Clay county. Additional mines will be taken over at once. The two pits now being operated produce about 18,000 tons monthly, enough to care for state institutions. Eventually McCray hopes to mine enough to supply public utilities and basic industries.

If the original venture is a success McCray promises to take over all the mines necessary. At present some of the pits are being operated by receivers. In these cases the mines are virtually being operated by the federal government, as the receivers are agents of the U. S. court.

AT THE THEATERS

"THE TIMBER QUEEN" ON VIEW

Today only in addition to the regular program, Episode Three of "The Timber Queen" will be seen at the Parkway. This is the thrilling chapterplay featuring Ruth Roland. The regular bill, which closes tonight, consists of Alice Lake and Harry Meyers, of "Connecticut Yankee" fame, in "Kisses" as the feature attraction. "Kisses" is an exceptionally well produced comedy drama. Lee Moran in a century comedy "Henpecked" furnishes the comedy, and Topics of the Day and the latest issue of Screen Snapshots complete the film program. Raymond Coy is featuring "Little Thoughts" on the big Kimball organ this week.

Tomorrow Tyrone Power and Estelle Taylor will be the stars of a gripping mystery play "Footfalls." The Pathe Review and a Rolin comedy "The Man Haters" will also be seen.

Friday Tom Mix is coming in his newest picture "The Fighting Streak."

SHE HELPS HER HUSBAND

Wanda Hawley and T. Roy Barnes are now being shown at the Strand Theatre in "Too Much Wife." This clever comedy, first introduces us to the heroine on the eve of her wedding, when her maiden thoughts are all for self-sacrifice and making her beloved happy. First the bride heroically shares all her husband's amusements, although she does not enjoy them. Yet she is dismayed to find him becoming nervous and irritable.

Then, resolved to share his business as well as his pleasures, she at last invades his office, dismisses his stenographer, and takes over the job herself. The plot thickness rapidly from this point. The added attractions are a Larry Semon comedy "The Fly Cop," the latest Pathe news weekly and Movie Chats.

NOVELTY PLOT IN "BORDERLAND"

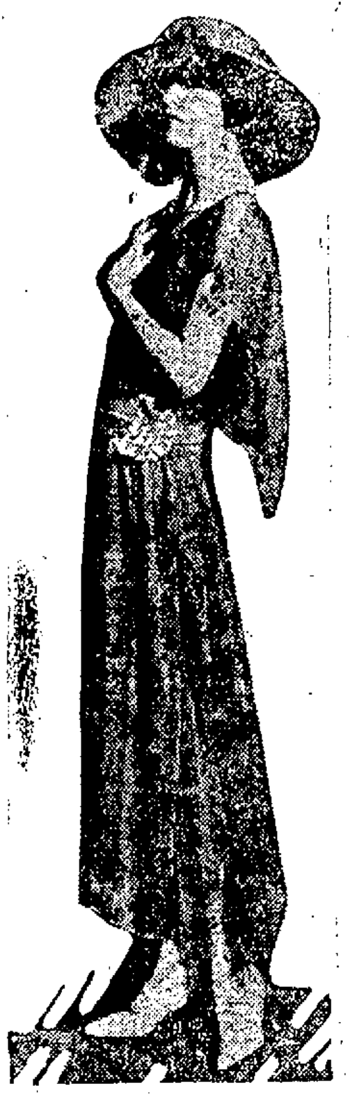
A novelty, a decided change from the usual in photodrama, "Borderland," a Paramount picture, starring Agnes Ayres, struck a responsive chord on its presentation at the Majestic Theatre last evening.

"Borderland" gives two complete plots for the price of one, presents two separate sets of characters—and offers the star three differing characterizations. The supernatural is cleverly used to enhance the dramatic effect.

Miss Ayres gives a delicately differentiated bit of work as the jazzy, modern Edith Wayne, the hoop-skirted Dora Becket and the wistful spirit.

A two act "Torchy Comedy" and International News showing the wedding of Jack Pickford and Marlyn Miller are also showing.

THIS HARMONY IS SILVER THREADS AMONG THE BLACK



This graceful black chiffon dinner gown has its edges illuminated by threads of silver stitched into the fabric. Silver cloth makes the girdle and a rosette of the silver cloth is a pretty finish.

Matinees 2 to 5
Nights 7 to 11
PARKWAY
Prices 25c-30c
Children 10c

chapter play
Last Times Tonight
Alice Lake and Harry Meyers
in
"Kisses"
A fascinating comedy-drama of love, confectionery and finance

TODAY ONLY
"The Timber Queen"
Episode three of this thrilling

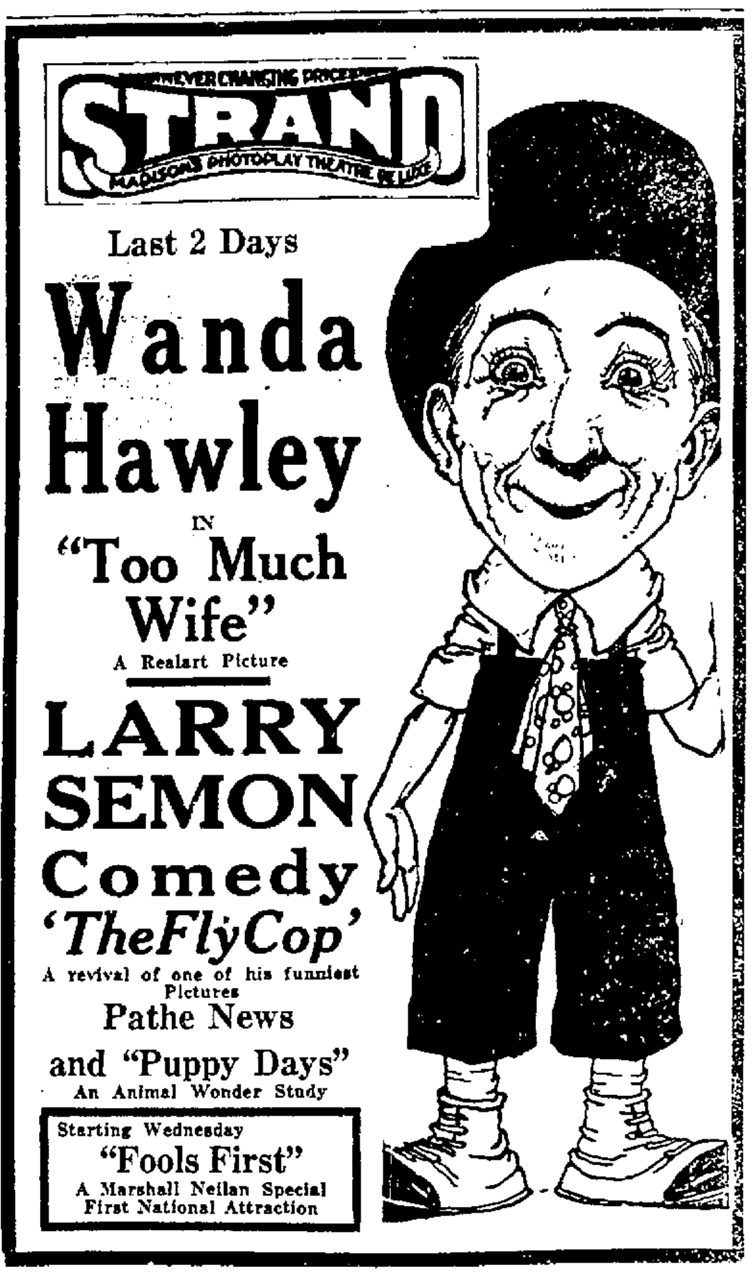
STARTING TOMORROW
TYRONE POWER in "FOOTFALLS"
A Gripping Mystery Play

Notice to Capital Times Classified Advertisers

The minimum charge on any want ad placed in The Capital Times is 25c. Take, for example, a certain ad which costs 15c per day. It is ordered inserted for three issues at a total charge of 45c. If it is cancelled after the first insertion, then the charge is not 15c, but 25c.

Information regarding Capital Times want ads is printed daily in the first column of the classified section.

FISCHER'S MAJESTIC
ADOLPH ZUKOR PRESENTS
Agnes Ayres
IN
"BORDERLAND"
A Paramount Picture
A drama of madcap love and its consequences. Milton Sills heads the great supporting cast.
—ALSO—
TORCHY
Comedy and
News Weekly

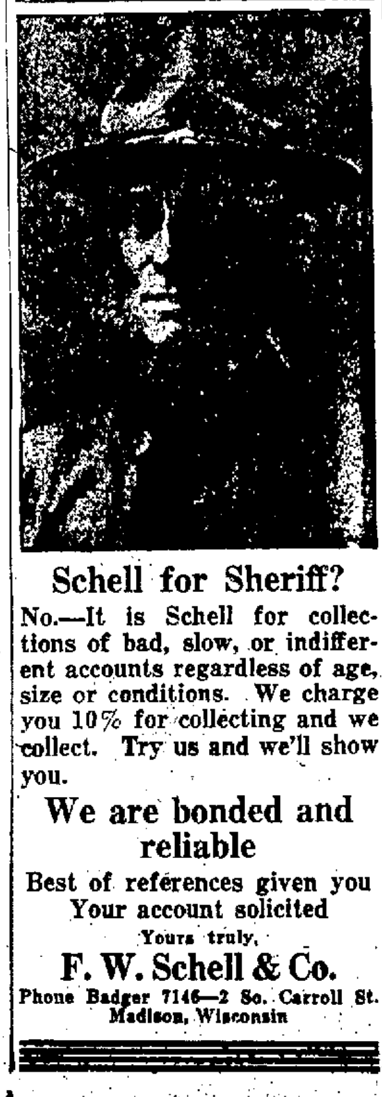


EVER CHANGING PRICES
STRAND
MADISON'S PHOTOPLAY THEATRE DE LUXE
Last 2 Days
Wanda Hawley
IN
"Too Much Wife"
A Realart Picture
LARRY SEMON
Comedy
'The Fly Cop'
A revival of one of his funniest Pictures
Pathe News
and "Puppy Days"
An Animal Wonder Study
Starting Wednesday
"Fools First"
A Marshall Neilan Special
First National Attraction

Clear Your Skin Restore Your Hair With Cuticura

Daily use of the Soap keeps the skin fresh and clear, while touches of the Ointment now and then as needed soothe and heal the first pimples, redness, roughness or scalp irritation. Cuticura Talcum is excellent for the skin.

Sample Each Free by Mail. Address: "Cuticura Laboratories, Dept. 27F, Malden 48, Mass." Sold everywhere. Soap 25c. Ointment 25 and 50c. Talcum 25c. Cuticura Soap shaves without mug.



Schell for Sheriff?
No.—It is Schell for collections of bad, slow, or indifferent accounts regardless of age, size or conditions. We charge you 10% for collecting and we collect. Try us and we'll show you.
We are bonded and reliable
Best of references given you
Your account solicited
Yours truly,
F. W. Schell & Co.
Phone Badger 7146—2 So. Carroll St.
Madison, Wisconsin

We Can Prove That Capital Times Want Ads Bring Results

The following three line want ad appeared in The Capital Times for three issues at a total cost of 48c to the advertiser.

WOMAN for general housework wanted four hours each morning. Apply Sunday ...... Badger ....

This little ad brought inquiry after inquiry—in fact so many that the advertiser could not keep track of them.

Try a Capital Times want ad tomorrow. It will bring you results also.

Phone Badger 2200

Serial Stories:-:Kiddies' Page:-: Household Hints:-: Cutouts:-: Heart and Home Problems

BED TIME STORIES

By HOWARD R. GARIS

Uncle Wiggily and the Soda Water

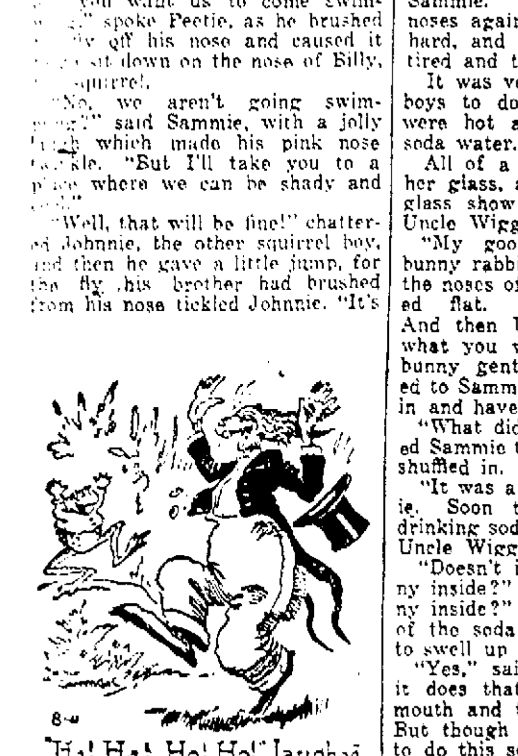
"[illegible]ome on, Jackie! Come on, Pe[illegible]tie! And you, too, Billie and [illegible]nnie! Come on!" cried Sammie [illegible]ttletail, the rabbit boy, one day, [illegible] saw the Bow Wow puppy [illegible] and the two Bushtail squirrel [illegible]

"Where do you want us to [illegible]?" barked Jackie, as he chased [illegible] off his own little nose and [illegible] the buzzing creature sail [illegible] and light on Peetie's nose.

"It's too hot to go anywhere, un[illegible] you want us to come swim[illegible]," spoke Peetie, as he brushed [illegible] off his nose and caused it [illegible] sit down on the nose of Billy, [illegible] squirrel.

"No, we aren't going swimming!" said Sammie, with a jolly laugh which made his pink nose twinkle. "But I'll take you to a place where we can be shady and cool."

"Well, that will be fine!" chattered Johnnie, the other squirrel boy, and then he gave a little jump, for the fly his brother had brushed from his nose tickled Johnnie. "It's



"Ha! Ha! Ho! Ho!" laughed the bunny.

a very hot day," added Johnny, "and I'd love to cool off."

"Where are you going to take us?" asked Jackie. "To the polar bear ice cave of Mr. Whitewash?"

"Oh, to a better place than that!" laughed Sammie. "Listen, fellows, Uncle Wiggily is down at the corner, in Dr. Possum's drug store, buying my sister Susie a glass of ice cream soda water."

"Well, what good does that do us?" Jackie wanted to know. "All the soda water your sister can drink in a week won't make us any cooler, Sammie."

"I know that," Sammie answered. "But if we go down to the drug store and stand with our noses pressed against the window on the outside, looking in, Uncle Wiggily will see us, and he can't do anything else but ask us in to have some, can he?"

The other animal boys looked at Sammie.

"That's a dandy idea!" laughed Peetie. "Uncle Wiggily is so good and kind that he'll ask us in as soon as he sees us looking hot and tired and thirsty."

"Let's run all the way down to the drug store," proposed Jackie.

"What for? Why run when it's so hot?" asked Johnnie.

"Because it will make us look all the hotter and warm," answered Peetie, "and when we press our noses against the window Uncle Wiggily will feel sorry for us."

They all thought that was a good idea, and soon the five animal boys were racing down the woodland path that led to the drug store of Dr. Possum. When they reached the place, sure enough, there was Uncle Wiggily sitting inside on a merry-go-'round stool, drinking soda water, and there was Susie Littletail, the rabbit girl, doing the same thing.

"Come on, fellows!" exclaimed Sammie. "He's here all right—noses against the window—press hard, and everybody look hot and tired and thirsty!"

It was very easy for the animal boys to do this, for they surely were hot and oh! so thirsty for soda water.

All of a sudden Susie put down her glass, and pointing to the big glass show window, she called to Uncle Wiggily: "Look!"

"My goodness!" exclaimed the bunny rabbit gentleman as he saw the noses of the animal boys pressed flat. "How extraordinary!" And then Uncle Wiggily did just what you would expect that jolly bunny gentleman to do. He called to Sammie and the other: "Come in and have some ice cream soda!"

"What did I tell you?" whispered Sammie to his chums, as they all shuffled in.

"It was a good trick," said Jackie. Soon the animal boys were drinking soda water with Susie and Uncle Wiggily.

"Doesn't it tickle your nose funny inside?" laughed Susie and Unny inside?" laughed Susie as some of the soda water bubbles seemed to swell up to her mouth.

"Yes," said Sammie, "but when it does that way just open your mouth and the tickling will stop." But though the animal boys tried to do this sometimes the gas bubbles of the soda water came so fast that they felt like laughing, and sneezing at the same time, which is a very hard trick to do.

All of a sudden, when the last of the soda was almost gone, into the drug store came the old Woozie Wolf.

"Oh, ho!" growled the Wolf. "My friend, the Fuzzy Fox, said Uncle Wiggily was here. Now to nibble his ears!"

"Oh, before you do that!" cried Dr. Possum, "have a glass of soda water, Mr. Wolf!" and he set before the bad chap a glass of extra strong soda full of bubbles.

"Well, I'll drink the soda, and then I'll nibble ears!" howled the Wolf. So he drank the soda and then, all at once, his nose and mouth were filled with bubbles of gas. He closed his lips tightly, not knowing any better, and then as the bubbles went up his nose the Wolf howled: "Oh, what's the matter! I feel like a balloon! Oh, what a trick to play on me! Oh, wow!" and away he ran, having the hiccoughs and sneezes at the same time, all on account of the soda water bubbles.

"I guess everything is all right now," laughed the bunny gentleman. Then he bought each of the animal children a lolypop, and they were very happy. So if the gas stove doesn't try to walk on top of the fence with only two of its legs, and fall off into the pansy bed, I'll tell you next about Uncle Wiggily and the drooping rose.

"The Gift of Abner Grice"

By ROBERT BARR

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Published by arrangement with The Literary Digest Newspaper Syndicate.

(The beginning.)

The tramp leaned over the gate, [illegible] at the trim garden and the [illegible] little one-story cottage. The place was perhaps an acre in [illegible], and the cottage seemed [illegible] for the size of the [illegible]. The tramp was not in [illegible] fettle, or he would not have hesitated so long about entering. His nerve had given way, and he [illegible] there might be a dog or a man about the premises. His [illegible] him, and the freedom of [illegible] out of doors had [illegible]. The world had gone [illegible] and there was too much [illegible] for a waif of the [illegible] comfort. He was [illegible] village at the [illegible] the cottage [illegible] have something [illegible].

A [illegible] girl approached, looking [illegible] at him, but her shrinking from him [illegible] resentment [illegible] tramp's [illegible] he was [illegible]

"[illegible] lives here, little girl?"

"Aunty Mehitable and Aunt Euphemia," she answered, gazing at [illegible] surprise [illegible] eyes, am[illegible] asked what every one [illegible] to know. Then she [illegible] as fast as she could, and [illegible], watching her flight, op[illegible] gate and entered the garden.

[illegible] man could hardly [illegible] better choice if he [illegible] day in search of [illegible] which to obtain [illegible]. The tiger of the [illegible] kept the village [illegible] of suspicious wan[illegible] was believed that [illegible] roads leading to [illegible] marked with those [illegible] the hieroglyph[illegible] tramp, which warned [illegible] fraternity that no[illegible] expected here but [illegible] of the lockup. [illegible] the Misses Bassett never [illegible] unduly imposed [illegible]

Whether Mehitable was older than [illegible] or Euphemia older than Mehitable, nobody knew. Mehitable was called aunty, and Euphemia aunt, by every one in the village; but whether the slight distinction in their titles arose through euphony or because aunt was supposed to be older than aunty, or vice versa, is hard to tell. It could not be that one was thought [illegible]ter than the other, for each was the most lovable old lady, and the most innocent and unsuspicious, that ever made nephews and nieces of the entire juvenile population. They had an income which many would have considered meager, but which the old ladies found large enough to share on occasion with those in need. The cottage and the garden belonged to them, and the fact that they had no rent to pay was their excuse for many benefactions which seemed larger than they could well afford.

In an outhouse that had once been a stable, their gardner lived, as loitering an old fraud as ever idled his time away at other people's expense, yet the ladies could never be made to see this. When spring came, he would leave them to get higher wages elsewhere, returning dolefully in the autumn to be reinstated when there was little for him to do. As a gardner is chiefly for use from the springtime onward, the Misses Bassett found themselves compelled to do most of the work with their own hands. The veranda of the cottage stood at the back of the building, where it gave a view over the garden, and here, on this spring day, a week after the annual flitting of the deserted gardner, the two old ladies sat, when the tramp came round to them, saying he was in search of work, which was not true, and that he was hungry, which he was.

The old ladies bustled about to get something for him to eat, and such a dainty little meal as they spread, the tramp never before sat down to. Then they swayed back and forth in their rocking-chairs and gazed at him with a satisfaction less complete than his own, gratified to think that presently there would be one hungry man less in the world; and they questioned him, one interrupting the other in eagerness to elicit the pathetic story of his life. Pathetic, indeed, it was, for the man being utterly unhampered by truth, was thereby enabled to furnish them adorned fiction that went straight to their tender, unworldly hearts. He was a mechanic. He had been thrown out of work, through no fault of his own, all on acount of hard times. He had tramped searching for a job, and often, of, how often, had been tempted to steal: but when about to do so, the precepts of his childhood forced themselves on his memory, and he said, "No; I'll starve first." Consequently he starved.

Tears came to the eyes of the old maids and trickled down their wrinkled cheeks as they listened. With faltering voices, they begged him to eat more, and he did.

Once or twice, as he furtively glanced at them, his ragged remnant of conscience actully accusing him, a thing, it had no done for years, even when worse crimes than living were in question.

(To be continued.)

Billy Whiskers

By Frances Montgomery

At last the boys approached the mountains, that grand range that runs northwest and southwest through California, called the Sierras. Now each boy made his final preparations to try and soar over snowy mountain tops, as high as the eagles fly.

In spite of their decision to stick together nightfall found them widely separated.

Dick and Billy landed near a small mining camp where they had a supper and a good night's rest, and arose early in the morning much refreshed.

There were crowds in the little mountain camp all the day, fingering and looking over Dick's frail craft, in spite of the sign he had put on it, "Hands Off." At last they bothered him so he was forced to stretch a wire around it to keep them off.

It not only bothered him, but he was also afraid they might loosen some scre, or do some damage he would not notice until he was high in the air, and then it would be too late to fix it, as there are no repair stations in the skies. He also had to listen to all such discouraging remarks as these:

"Say, young fellow," from a big burly miner from New Mexico, "don't you think you are committing suicide by trying to fly across these here mountains? Why, even the eagles can't live in the storms up there. When the wind gets to blowin' around them peaks, it blows so all fired hard, it nigh blows the feathers off of um, and they can't spread their wings at all. One of them icy gusts will freeze your fingers and toes and ears so hard you can't feel um and you'll think you must have left um to hum. As fur this musquiter machine of yourn, the wind will strip it wings off and double the framework up in two shakes of a lamb's tail."

"You're right, it will," said another hanger-on." You fellers from the East, where your country is rolled out like a piece of dough, don't seem to know anything of our bumpy western country. Why, I've heard tell that away back in Kansas, you can travel for miles and miles by train and not see a tree or hill as big as a South American ant-hill."

"De genmen what has jus been talkin', do be tellin' yuh de truf," said an old darkey. "It am mighty cold and windy up dar where de snow am so deep dat the sun can't melt it, do is shine ebery day all de summer long, case the winter will done kotch up wid him, befor he done get it done."

[Tomorrow you will hear of Billy's new found friend.]

ONE TRICK A NIGHT

TO CAUSE WATER TO FREEZE BY THE FIRESIDE

Here is a really scientific little feat, that can, however, be performed only in the winter time.

The magician having secretly provided himself with a little salt, say a handful, calls for a stool, a quart pot, a handful of snow, and a short stick.

Unbeknown to the audience, he pours a little water on the seat of the stool, and sets the pot upon this. The snow is then placed in the pot. While doing this he drops the salt in also, but secretly. The pot is held fast with the left hand, and with the right the mixture is stirred in the pot.

In a very few minutes the pot will be frozen fast to the stood that one will scarcely be able to pull it off with both hands.

* * *

Next: THE PICTORIAL NAIL

It's pasteurized—It's pasteurized,
All other milk is ostracized;
No longer will we fume and fret
About the dirty milk we get.
It's pasteurized—it's pasteurized.
All germs are cooked or paralyzed
We've pulled their teeth and cut
their claws
By patching up our dairy laws.

Garner the garbage.

A. E. F. now means I. O. U.

More fresh fruit—less fried food.

MOTHER GOOSE DOT PUZZLE

What goes high and goes low but never touches the sky or the ground?
answer
853

TWO'S COMPANY, THREE'S A CROWD, SO THEY ARE MARRIED BY RADIO

Mr. and Mrs. Roy H. Schoffel, snapped in their plane on landing just after the radio marriage ceremony.

Miss Eva Burdick and Roy H. Schoffel wanted to be married in an airplane. The one they had for the purpose at Portland, Ore., had room for just two persons. So the Rev. Russell Brougher, who performed the ceremony, ran to a radiophone broadcasting station as soon as the plane hopped off and married the happy couple by radio.

The Story of

An Unloved Wife

As Told to Grace Phelps

DORIS' NEW LIFE

It was a relief to get away from the problems of my married life by beginning my studies at business college. I found that there was so much I did not know. For instance, I had to go into a spelling class and learn how to spell. Any word over two syllables was sure to put me in a panic and I failed on even some of the two syllable words. I'll never forget my humiliation when in a spelling bee review of our first week's work I went down on the word "awkward."

At first I thought I never would get the little pot hooks and dashes and their meaning straight in my mind, but presently I began to find that they were coming easier and very soon I began to make mental shorthand translation of conversations I overheard in the street cars or even when someone was speaking to me.

Alec had made no objection when I told him what I wanted to do. It meant of course that I had to ask him for the money but after having heard from Aunt Eleanor all that my father had done for him I did not feel quite the same reluctance as formerly, when it came to a question of taking money from him.

Sarah Ann was writing me most enthusiastic letters from the ranch. Neel was learning the business of running the place and was rapidly proving that he was far more suited to such a life than the one his father had picked out for him. As to Cornelius, Sr., there had been dead silence from him. Occasionally a letter would come from Neel's mother but it was evident she was too much under her husband's thumb to come out openly and insist that Sarah Ann should be recognized as his son's wife.

Not, as Sarah Ann wrote, that it made any real difference, except that she was sorry to have been the cause of the estrangement. But what a foolish old man to cut himself off from his son just because that son did not consult him concerning the girl he married.

I felt all this time as if I were leading a double life—one as a school girl again but as a school girl with a purpose this time, and the other as the wife of a successful business man, for such I was in the eyes of the world.

Alec's marriage had of course been given prominence at the time I ran away but it was not until the fall that I began to meet his old friends and acquaintances. I don't know what explanation he gave to account for that awkward period but it is more than likely he intimated that my grief for my father had something to do with it. Never having been in mourning because my father did not wish it, it was easy for me now to come out and take my place in society as Alec's wife. I should have preferred not to but Alec seemed bent upon it for some reason or other and I thought I could use my business college work as an excuse to avoid some invitations. I had to do my share of entertaining and being entertained. It almost seemed as if Alec were trying to make me fail in my new undertaking but I put that thought away as absurd.

Dinners and bridge parties and occasional theater parties seemed to be the most popular forms of entertainment among Alec's friends. Most of them of course were older than I but among the wives there was one girl only two or three years my superior. Estelle was thoroughly modern. Her husband was more than twice her age and Estelle's motto was "Take what you want where you find it."

It was very early in the season that I discovered Estelle's choice had fastened upon Alec.

(To be continued.)

Shopping Economy

By MRS. HARLAND H. ALLEN

How Antiques May Be Faked.

Collectors and antique dealers tell a story among themselves of a woman brought before a judge in England, and upon being asked her husband's business, she replied, "He's o worm-eater."

"A what?" exclaimed the judge.

"A worm-eater," she said, "he makes worm-holes in an antique furniture factory."

There are several ways in which antiques may be faked, and if you are a prospective buyer it is just as well to know what these methods are in order to avoid being swindled.

Perhaps the cleverest fakes are made from old bits of genuine antiques—pieces of an old chest, too delapidated to sell, put together with parts of an old bedstead, ta make an entirely new "Antique." This deception is often complete to the uninitiated, but on careful examination, the use of a new nail or peg here, or a bit of recently dried glue there, will give the deception away.

Another method is to increase the value of a plain, genuine antique by means of added carvings, inlay, and so forth. Such a piece is said to be "glorified." These elaborated antiques are most difficult to detect, especially if the whole has been refinished. Always look at the joints. You may be able to discover a difference in color between the old and new wood. Where a bit of the finish has been scraped off, this difference will be plainly apparent. Be on the lookout for recent sawmarks or evidence of sandpaper.

The third sort is where the piece is faked entirely. New wood can be made to look like old by the use of chemicals, kicking the legs of furniture produces the necessary dents, and plenty of realistic worm-holes can be artificially introduced. Always examine the under side and inside of things for a modern screw—old screws were handmade and therefore rougher and more irregular—or for any look of newness about the hidden portions.

It is of course impossible to prepare a "handy guide" which you can read and at once find wourself an authoritative antique buyer. It takes years of experience to make a skilled collector, and even experts are occasionally led astray. If you plan to pick up a piece now and then it would be best to get the advice of an expert whenever you can and to buy only from a reliable dealer whose word you can trust.

DAD'S DAY

We have a day for mother
And all the kids are glad;
But the day the home team plays,
'S the day for poor, old dad.

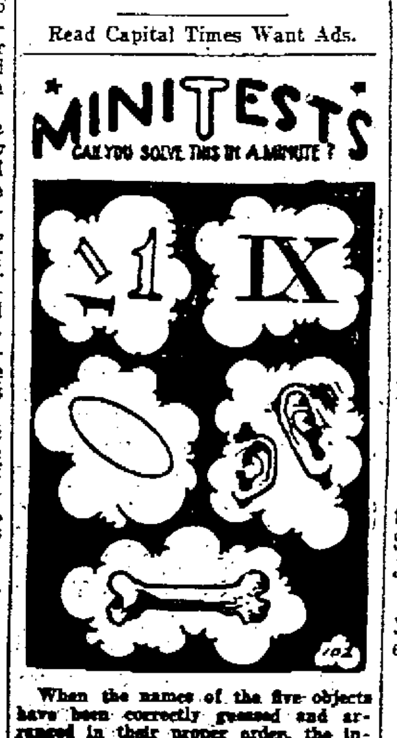
In this old world of ours grit beats Greek.

Learn your boy, then teach him.

A woman may buy a permanent wave but, for man, there's no permanent shave.

Most "prepared"—"ready to wear"—foods are fresh foods with the vitamines knocked out.

Read Capital Times Want Ads.



MINITESTS
CAN YOU SOLVE THIS IN A MINUTE?
1
IX
102

When the names of the five objects have been correctly guessed and arranged in their proper order, the initial letters will spell the name of a famous American frontiersman.

The answer will be given Monday.

Answer to Yesterday's Puzzle
I stood on the bridge at midnight.

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Household Hints

MENU HINT.
Breakfast.
Sliced Peaches
Scrambled Eggs Toast
Coffee
Luncheon.
Green Corn
Rolls Jam
Bread Pudding Milk
Dinner.
Stewed Beef Shank with Vegetables
Lettuce or Cabbage Salad
Marshmallow Cake Coffee

TODAY'S RECIPES.

Miss Madge Bellamy, the motion picture actress, has sent us some of her favorite recipes and we are using two of them in today's service.

Bread Pudding (Madge Bellamy) —Two and one-half cups of stale bread crumbs, one cup milk, three-quarters cup sugar, one egg, one teaspoon cinnamon, two tablespoons butter, one-half teaspoon salt. Bring milk to boiling point in pan. Pour over bread and let stand in warm place until milk is absorbed. Add butter, sugar, cinnamon and egg and beat thoroughly. Turn into buttered pudding dish and bake in moderate oven.

Sauce—One-half cup butter, one cup brown sugar, one teaspoon vanilla, nutmeg. Beat butter to a cream. Slowly beat in sugar, add vanilla and nutmeg.

Stewed Beef Shank—A most excellent and economical dish. Take a shank of young beef, place in a kettle and nearly cover with boiling water. Cover closely and weigh the cover down. Simmer gently until the meat drops from the bones. Season with salt to taste. Remove the bones and cut the meat, fat, gristle and all, in pieces about as large as a hen's egg. Replace the meat in its own liquor. When cold take off the grease and the balance will be like a hard jelly. When needed take out as much of the meat and jelly as wanted for the meal, cook as many vegetables as wished in the stew, carrots, turnips, onions, cabbage, a little celery etc., according to the taste of the family. The vegetables may be take nout aid the stock thickened, if liked. Potatoes may also be a part of the stew or either boiled or baked and served with it. Pepper to taste.

Marshmallow Cake—(Miss Bellamy says: Mother always bakes this for me on my birthday.) One cup butter, two one-half cups sugar, two one-half cups flour, eight eggs (whites), one-half cup milk, two teaspoons baking powder, two teaspoons vanilla. Beat butter to cream and slowly beat in sugar. Sift flour and then measure. Add baking powder and sift again. Add flour and milk alternately to first mixture. Add vanilla and whites of eggs beaten stiff. Bake 20 to 25 minutes in moderate oven. Put together with marshmallow icing.

Canned Pimentos—After removing the stems, cook in salted water for fifteen minutes. When coll, remove the seeds and peel them. Pack in fruit cans. Reheat the water in which they were cooked, pour it over them and seal.

Take All Stale Bread, slice what you can and place in oven, toast it light brown, then let cool, roll and place in glass jar with cover; keep dry. Use crumbs for breaded meat chops and cutlets, puddings, meat soups and stuffing also to garnish different dishes. For kitchen mix bread crumbs, sugar and cinnamon and a few chopped walnuts or almonds. Melt butter, spread on dough: then the above ingredients are all ready for oven.

Sheriff In Drinking Party Ordered Ousted

LANSING, Mich. — The order of Gov. A. J. Groesbeck removing Sheriff Ray Baker of Lapeer county from office was upheld by the State Supreme court. Baker was charged with participating in a midnight drinking party. When he refused to quit office, the state brought an action before the Supreme court.

Socialist Woman Is Governor Candidate

MINNEAPOLIS—Mrs. Ilma M. Olson has been selected as socialist candidate for governor.

RAILROAD MECHANICS AND HELPERS

WANTED BY THE

CHICAGO & NORTH WESTERN RAILWAY CO.

On account of the action of a number of our shop and engine house employes, who left the service in defiance of the United States Labor Board and are now on a strike, the Chicago & North Western Ry. is in need of the following:

Machinists and helpers.

Boilermakers and helpers.

Blacksmiths and helpers.

Car repairers and helpers.

Sheet metal workers and helpers.

Car inspectors.

Wages and working conditions prescribed by the United States Labor Board, effective July 1, 1922, will be applied.

An excellent opportunity for young and energetic men to engage in railroad work.

Apply at once to
129 N. CLINTON ST.,
CHICAGO, ILL.
or at nearest shop or car repairing station.

Mrs. Thompson's Advice

MAN DIVORCED WOULD REMARRY

Wants to Marry Former Wife; She Put Him Off Now Man Has Ruined Happiness

I AM 42 years old. When we had been married 18 years, my wife got a divorce. I didn't do exactly right, as I drank a good deal at that time. That was three years ago. I still love her and cannot bear to see her out or to pass on the street without being worried almost to death. She admits that she still likes me and when I ask her to marry me again she says she will, some time, but she always keeps putting it off. She is afraid that if we marry again her family and her friends will criticize her. She is a good woman and I have never been happy since she left me. I am a good worker, but with this burden on me I can't stand the situation much longer. We have a son, 20 years old. How can I win her again?—G. C.

IF your former wife has promised to marry you again, but keeps putting it off, perhaps it is because she does not yet feel that she can trust you entirely. You wilfully threw away your happiness. It may take time to regain it. Are you very sure that you have overcome all the faults which led her to divorce you? If you have not, you can hardly expect her to risk the same trouble and differences which led to your separation.

If you have overcome the shortcomings to which she objected and if you continue to conduct yourself in a way which meets her approval, her family and friends will have no weapons against you. Point out to her that it is not at all likely that right-thinking people would criticize her for marrying you again if she has the assurance that you will do what is right. On the contrary, she should think that the best thing that could be done for her, for you and for your son. And you three are the only ones really concerned.

Enlist the help of your son. His influence should have a good deal of weight with his mother.

GOES TO DANCES.

Dear Mrs. Thompson: There is a boy who goes to the same dances I do and he dances most of the time with me. He wants me to go around with him, but he also goes with a girl who has a bad reputation. His reputation also is not of the highest quality, but I like him very much. My parents do not want me to go in company yet as I am only fourteen years old. The boy is seventeen years old.

He and I are always invited to the same parties and dances and he always brings me home, although he always takes another girl to parties.

Am I too young to go in company yet?

Should I permit him to bring me home if he does not take me to parties?

Should I allow another boy to take me around even if the former boy is jealous of me?

LONESOME KAY.

* * *

You are very much too young to go to dances alone and to keep company with boys. Unless you are careful you will cheapen your good name and people will say that your reputation is not any too good.

A girl cannot be too careful of the friends she chooses and therefore I would not advise you to think seriously of the boy of questionable reputation who goes with a girl of bad reputation. If you were seen much with him your name would soon be linked with the name of the other girl.

As yet you are too young to go with any boys. Jealousy on the part of the boy you like makes no difference, however. He has no claim on you.

* * *

SHE'S IN LOVE.

Dear Mrs. Thompson: I am going with a young man who is dearer to me than any one in the world. I am sure he loves me, too, but there are conditions which keep him from telling me so.

About a year ago his father invested all his money and lost it. It was money he had inherited and which the family counted on for living. With that money gone all he had was a small salary. The young man I go with had intended to go back to college, but instead he had to go to work to help support the family.

I want him to tell me he loves me, but he seems as far from doing so now as ever. You will probably say that if he loved me deeply enough he would not let anything stand in the way of telling me. I feel sure, however, that he would say something if it were not for the conditions at home. I can tell in other ways that he loves me.

What can I do to make him say something?

ANXIOUS.

Do not try to make the young man say something. If you love him you can help him with your sympathy and loyalty. He will work out the problem in his own way and when he feels free he will express his love for you. To try to force him to say something would be very unwise. If he felt your purpose you would be cheapened in his eyes.

* * *

RAIN WATER.

Dear Mrs. Thompson: I have heard that rain water is good for the skin. A friend of mine says it is a good thing to go walking in the rain and let it fall on the face. Is that true?

DOUBTFUL.

Rain water is soft and soft water is good for the skin. If you go walking in the rain just once you will notice that your skin is softer and clearer afterward. Of course one application of rain would not do any permanent good, but if you washed in soft water, I think you would see an improvement.

Man Kills Wife And Then Commits Suicide

PLAINFIELD, N. J.—Louis B. Goldstein, a grocer, is dead by his own hand today and his wife occupies an adjoining coffin, the victim of her husband. After killing his wife, Goldstein turned the revolver upon himself.

WHY

does everybody know we deal only in First Mortgage Investments that are SAFE?

BECAUSE

so many people have for years been collecting interest and principal on investments bought from us and have become accustomed to get their money promptly when it falls due.

The Joseph M. Boyd Company
ESTABLISHED 1906
Mortgages and Bonds
MADISON
Capital and Undivided Profits $200,000.00
We Buy and Sell U. S. Government Bonds.

$100 $100

ONE HUNDRED DOLLARS REWARD

For evidence producing arrest and conviction of parties who kidnapped employes or who otherwise have violated, or who hereafter violate United States Court Injunction which prohibits picketing, or any form of interference with this Company's employes present or prospective.

Chicago & North Western Ry. Co.

The Records In Dane County

BIRTHS.

At General hospital—Girl to Mr. and Mrs. Henry Schmidt, 118 N. Bassett st.; boy to Mr. and Mrs. Gilbert Jamicek, 445 W. Gilman st.; girl to Mr. and Mrs. J. A. Glass, Sun Prairie.

BUILDING PERMITS.

Gay Bros., brick store, 725-727 University ave., $10,000.

George Burrowbridge, garage, 1726 Monroe st., $165.

C. D. Dietrich, frame garage, 1115 Drake st., $100.

Mike Malos, repairs, 524 W. Mifflin st., $350.

NEW CORPORATIONS.

Fox River Motor Car Co., Green Bay, to deal in automobiles, accessories, etc.; $100,000—1000 shares at $100 each; Chas. W. Collins, Lynn D. Joseph, E. M. Stenger.

Neugent Products Co., Green Bay, manufacture serial products, soft drinks, near beer, candy, etc.; $80,000—800 shares at $100 each; Jos. P. Neugent, E. M. Stenger, E. L. Eversen.

Acme Tool Co., West Allis, manufacture of machinery, tools and implements, etc; 600 shares without nominal or par value; J. F. Schmaufer, George Hoffman, Peter H. Mayes.

Waukee Outing Club, Milwaukee, non-stock; conduct outings, sociables, etc; Edmund Sokolowski, Walter Sokolowski and Edmund Dudzik.

FOREIGN CORPORATIONS.

Cardona, McManus & Co., Chicago; sale of investment securities; $125,000—preferred $100,000; common $25,000; Thos. J. McManus, H. Y. McMullen, Thos. J. McManus.

News From Nearby Towns

Monticello Family Entertains Indiana Guests

MONTICELLO, Wis.—Mr. and Mrs. George C. Steinman will have as week-end guests, Mr. and Mrs. Elmer L. Goldsmith of Indianapolis, Ind.

Mrs. Emil Schweitzer visited friends at Belleville, returing Friday.

Charles Snyder was at Monroe Friday.

Frank M. Covert of Milwaukee spent several days here on business relating to the Northwestern Casualty Co.

Miss Helen Doyle visited at Monroe Friday.

Simon Saucermann and George Butler of Monroe motored here this afternoon.

Mrs. C. Bremer Buried At Middleton Thursday

MIDDLETON, Wis.—The funeral of Mrs. C. Bremer was held from her home, Thursday, and was largely attended. Rev. Soldan of the English Lutheran church conducted the services.

Francis Verna and John Hilgers returned Thursday after spending a week with their aunt, Mrs. T. J. Nettekoren, at Plainview, Minn.

Rev. J. E. Lederer and relatives spent Thusday at Osceola Lodge on Middleton Beach.

August Burmeister and wife of Milwaukee are visiting Middleton friends.

The Royal Neighbors gave a variety shower in honor of Miss Louisa Maulbetch, Tuesday, whose marriage to Walter Holstein of Waunakee took place recently.

Bernard and Arnold Esser of New Ulm, Minn., spent Sunday with Mrs. U. Baltes.

Adelia Koellen, daughter of Math Koellen, was married to Michiel Valentine, formerly of Cross Plains at Waukegan, Ill., Aug 8.

Miss Anna Dick arrived here Tuesday from Chicago where she graduated from the national school of cosmetics.

Miss Pear Dewey returned home Friday from Battle Creek, Iowa, where she has been teaching the past year. She has just completed a six weeks' course at Drake University at Des Moines, Ia.

Miss Mary Walsh of the Elite Shop is in Milwaukee purchasing her fall stock of millinery.

Algert Heming and wife of Madison spent Sunday with the parents of Mrs. Heming, Mr. and Mrs. Aug. Brunkow.

Mr. and Mrs. Louis Dewey are entertaining her sister and husband, Mr. and Mrs. Clarence Rowley.

Mr. and Mrs. Edw. Hendrichs are spending their vacation at Fond du Lac, Wis.

The Misses Kolm of Nebraska are being entertained at the home of their sister, Mr. and Mrs. Henry Staak.

Mr. and Mrs. Henry Niebohr entertained a number of friends at their home last Sunday.

Mrs. John Huberland of Verona spent a few days with her daughter, Mrs. Charles A. Schwenn.

Arline Rowley, Velra Pierstorff, Barbra Disk and Mabel Wiesenberg are taking an outing at the Weisenberg cottage at Middleton Beach.

Miss Marie Hoffman is visiting at Gotham, Wis.

A number of young people of this village expect to leave for Shawano Lake by auto Saturday to visit Rev. Stubenvoll and wife. Rev. Stubenvoll was a former minister here.

Hail Storm Ruins Crops At Poynette

POYNETTE, Wis.—Last Thursday Poynette and vicinity was visited by the worst rain and hail storm in years.

The gardens about town and immediate vicinity were leveled and several fields of corn and tobacco near here were completely destroyed.

Last Thursday night the receiving box, kept at the depot for the purpose of holding the mail for the late train was broken open and a mail sack and contents taken.

Columbia county tobacco growers met at Lodi, Monday, July 31, and elected delegates to the meeting of the State Tobacco Growers' Association which will be held in Madison.

Among the delegates elected to the state convention were J. M. [illegible] Lodi and Dane; Robert Steimke, Leeds; Peter Sharpee, Hampden; Ben Grinde, Vienna and Mr. Erickson of Lowville.

Robert Steimke of Leeds was endorsed by those present as a candidate for state director and his name will be presented to the state convention.

Mr. and Mrs. Foster and son Charles and children of Minnesota returned last week from an overland trip to Michigan, to visit her mother, their daughter, Mrs. Roy Batty, accompanied them to Michigan.

Arena Farm Bureau Elects Officers For Year

ARENA Wis.—The first meeting of the Arena farm bureau was held at the Arena high school Monday night. A very interesting talk was given by Mr. Hall, of Rock county. Forty-four members were present. The following officers were elected: President, Joe Hogan; vice president, Edward Thomas; secretary, Harold Schoenemann; treasurer, Harve Bowden.

Mr. and Mrs. George Green and son, James, of Madison, Mrs. Harry Roberts and son, Alvin, of Milwaukee, Mrs. Jos. Sharratt and two daughters, of Mazomanie, Miss Verna Bowden, of Lincoln, Neb., and Miss Dorothy Bice, of Wapakoneta, Ohio, visited at the R. L. Roberts home, Wednesday.

Miss Kate Slightam, of Chicago, visited at the J. C. White home last week.

Mr. and Mrs. Sanford announce the arrival of a baby girl, Wenesday, August 2nd.

Dr. Brown and wife left last week for an auto trip to the northern part of Michigan.

Mr. and Mrs. Harold Davis and family returned to their home in Waukegan, Saturday.

Mrs. Henry Schloenmer and son visited relatives in Madison the latter part of last week.

Mrs. J. B. Davis, of Salt Lake City, Utah, visited several days last week at the George Hamilton home.

Michigan Woman Visits Brooklyn Family

BROOKLYN, Wis.—Mrs. Flora Townsend, aged aunt of Mrs. Lew Armstrong, returned with her from Iron River, Mich., and will remain at the Armstrong home for some time.

Miss Wilna Roberts left for Aspen, Col., this week to enjoy a vacation with her uncle and family. Miss Roberts will teach another year at Columbus.

Mesdames Theodore Sprecher, John Odegard, Jess Mason and Merlin Winter were entertained at the home of Mrs. Ernest Winter Thursday at a sewing party in honor of Mrs. Paul Hubbard of Baker, Mont.

Mr. and Mrs. F. H. Anderson and son, Irving and Bryant, Grace Mitchell Plumlee, Mr. and Mrs. H. A. Miller and three children, Emily, Keith and Clayton left for Lake Kegonsa Sunday for a few weeks' outing.

Mr. and Mrs. Wiliam Oscar and children spent Sunday at their cottage at Lake Kegonsa.

Miss Mabel Brictson was entertained this week at the home of Mr. and Mrs. Odegard. Miss Brictson was a former teacher here.

Elam Leary of Evansville is a guest of his grandmother, Mrs. Lynn Johnson.

Lieut. Hary Baldwin returned to his home here Sunday for a furlough. Threshing on his farm needs his supervision.

Mises Jane Bethke and Viola Lagatz of Germania, Wis., are guests of Mr. and Mrs. Eric Ross.

Mr. and Mrs. Chelsea Hubbard of Edgerton were here this week visiting relatives. The Hubbards visited in Evansville with Mr. and Mrs. Erick Curless where a picnic was held Sunday at Leonard's park for the relatives. Theodore Curless and family from here were unable to be present at the reunion.

Owen Roberts departed for Two Harbors, Minn., Friday to meet Mrs. Roberts who is there visiting.

Rev. and Mrs. J. M. Barnett, Mt. Horeb, announce the engagement of their daughter, Floy, to John Merill Fargo, Madison. Mr. Fargo is assistant professor in the College of Agriculture in the U. W. He is a member of Sigma Phi fraternity.

Mr. and Mrs. McHenry of Madison were here, Sunday, guests of their relatives.

Mrs. John Kivlin and son and daughter went to Ridgeway, Sunday, returning here Monday. Miss Chiverton, who was their guest, accompanied the Kivlins to her home where they visited Mrs. John Cullen and family in Paoli. Mrs. Cullen entertained a party of twenty relatives that day at her home. A. O. Barber and wife and three daughters of Chicago, Mrs. William S. Ross, Spokane, Loretta and Gertrude Cullen, Mrs. Fannie Duerst, Mr. and Mrs. L. A. Rought and son, Vertice, of Belleville were among the guests entertained.

Mr. and Mrs. Martin Olson of Stoughton were recently entertained at the John Odegard home. The Olson and Odegard families were entertained for dinner Sunday by Mr. and Mrs. Lee Campbell in Evansville.

James Dooly of Belleville motored here Sunday.

Bernie Christenson, who has been in a hospital in Madison, was able to visit his parents here this week.

Mr. and Mrs. Thomas Hoggs and children, Mrs. Frank Fincher and daughter, Helen, of Oregon were callers at Ted Sweeney's home Wednesday. Miss Florence Freund of Fond du Lac returned here with the party and remained at the Sweney home a few days before departing for her home.

Miss Florence Tuttle, who has been a guest at the Lew Armstrong home for several weeks, returned to her home in Baraboo Saturday.

Mr. and Mrs. Lee Liney and son, Richard, who have been spending their vacation with his son, John, and family, returned to their new home in Chicago Sunday. Mr. Liney is an auditor for a railroad company in Texas and his headquarters will be in Chicago.

Mr. and Mrs. Edwin Waite arrived here this week from their home in Washington, D. C. They will attend the marriage of Mrs. Waite's sister, Ava Winter, who will marry Prof. A. K. Lyon Thursday, Aug. 10. Rev. H. Guy Campbell will perform the ceremony.

Mr. and Mrs. Walter Ahiens and two children of Middleton, Misses Ena and Mabel Buerger of Madison were Sunday guests of Mr. and Mrs. August Wartzak.

Mr. and Mrs. A. J. Barber and daughters, Blanche and Florence, motored here from Chicago and spent Thursday with Mr. and Mrs. Jees Mason.

Miss Jessie Lullis is at Fall River with her sister Mrs. Lane and children.

Among those who attended Dave Anthony's funeral held in Rutland Sunday were Mrs. Myra Roberts, and father, Elder Groves, Mrs. Addie Anhtony, Mr. and Mrs. Geo. Rasmussen, Walter Rasmussen, Dr. Clumlee, L. M. Burt, Mr. and Mrs. Charles Hook, Mr. and Mrs. William Oscar, Mr. and Mrs. Byron Amidon and Miss Anna Roberts.

Mrs. Harvey Main is now visiting relatives at Mukwanago. The village is near Waukesha where she may take treatments.

Ed. Stebnitz Hurt In Fall At Mazomanie

MAZOMANIE, Wis.—Edd. Stebnitz fell ten feet from a staging at the new bridge west of town, Wednesday, striking, on his head. He escaped further injuries than a few bruises and a shaking up, which will lay him up for a few days.

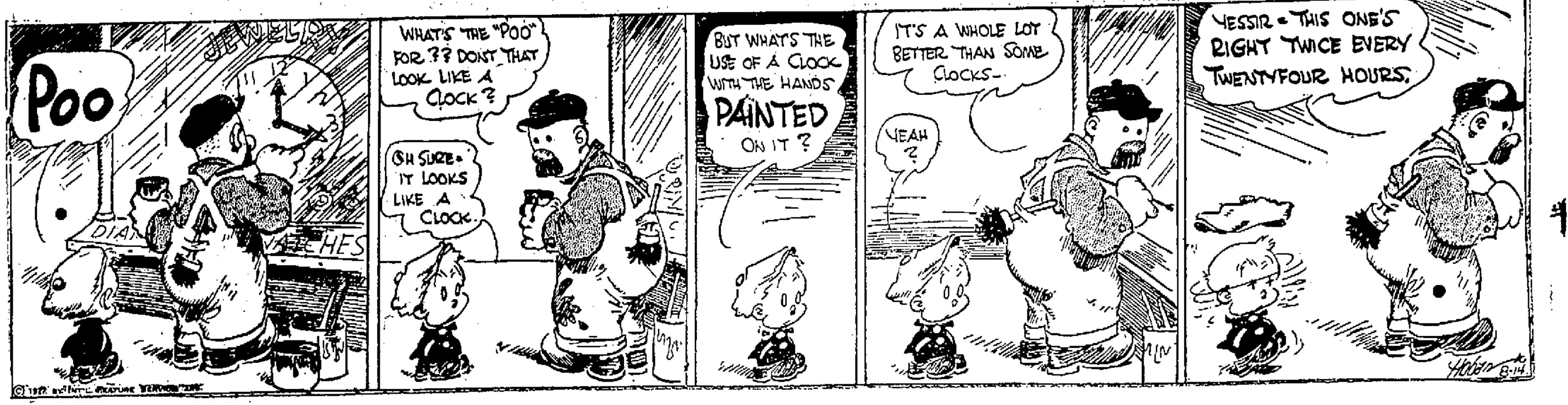
Mr. and Mrs. Kably and family, Mr. and Mrs. Lempka and family, Mrs. Amelia Higgins and daughter, Estella, and Mr. Schaller, motored from Madison and spent Sunday afternoon with Mr. and Mrs. E. L. Wolferman.

Five years ago Carl Schumann planted a plum tree at his home. This year is its first bearing year. And such plums! The tree is loaded with fruit averaging six inches or more in circumference, and is a most unusual sight.

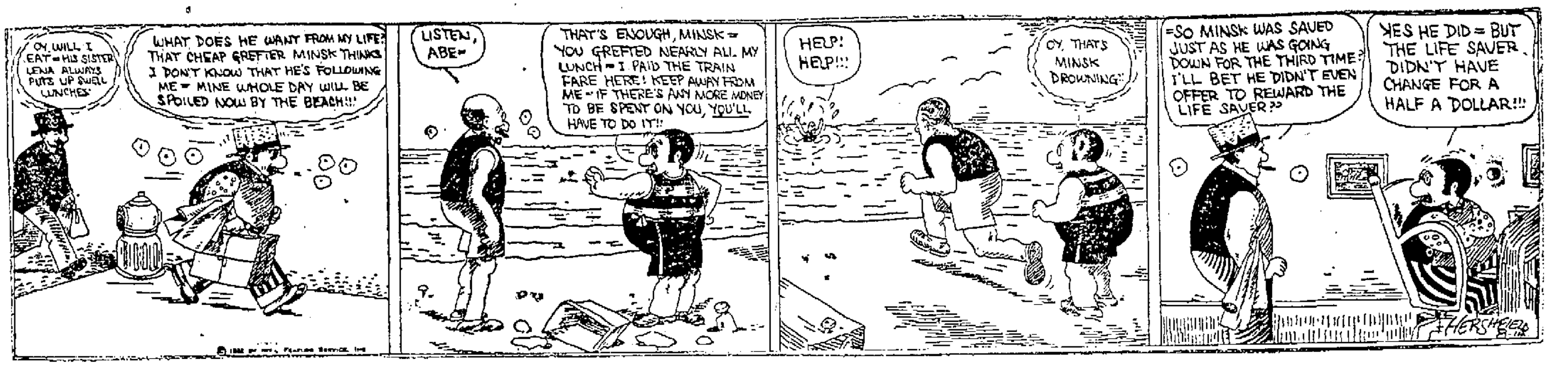
Mr. and Mrs. Jacob Wilkinson, of Chicago, stopped off with Mr. and Mrs. William Wilkinson, Sunday, on their way home from Canada, where they visited Tom Wilkinson.

Mr. and Mrs. Albert Gray and daughter, Miss Ruth, of Eldora, Iowa, and Miss Dunn, of Cedar Rapids, Iowa, drove to this place, Sunday, and spent several days at the home of Mrs. A. Wightman. Mr. and Mrs. Gray were former residents of this place.

JERRY ON THE JOB—Some Clocks Are Never Right By CLIFF STERRETT


POO
JEWELER
DIAMONDS WATCHES
WHAT'S THE "POO" FOR?? DON'T THAT LOOK LIKE A CLOCK?
OH SURE - IT LOOKS LIKE A CLOCK.
BUT WHAT'S THE USE OF A CLOCK WITH THE HANDS PAINTED ON IT?
IT'S A WHOLE LOT BETTER THAN SOME CLOCKS-
YEAH ?
YESSIR - THIS ONE'S RIGHT TWICE EVERY TWENTYFOUR HOURS.
Hoban 8-14

ABIE THE AGENT—A Narrow Escape for Minsk


OY, WILL I EAT = HIS SISTER LENA ALWAYS PUTS UP SWELL LUNCHES
WHAT DOES HE WANT FROM MY LIFE? THAT CHEAP GREFTER MINSK THINKS I DON'T KNOW THAT HE'S FOLLOWING ME = MINE WHOLE DAY WILL BE SPOILED NOW BY THE BEACH!!!
LISTEN, ABE-
THAT'S ENOUGH, MINSK = YOU GREFTED NEARLY ALL MY LUNCH = I PAID THE TRAIN FARE HERE! KEEP AWAY FROM ME - IF THERE'S ANY MORE MONEY TO BE SPENT ON YOU, YOU'LL HAVE TO DO IT!!
HELP! HELP!!!
OY, THAT'S MINSK DROWNING!!
=SO MINSK WAS SAVED JUST AS HE WAS GOING DOWN FOR THE THIRD TIME? I'LL BET HE DIDN'T EVEN OFFER TO REWARD THE LIFE SAVER??
YES HE DID = BUT THE LIFE SAVER DIDN'T HAVE CHANGE FOR A HALF A DOLLAR!!!
HERSHFIELD

TOOTS AND CASPER—The Results Are Apparent By J. E. MURPHY

GOOD MORNING AUNT SUSIE! WHY NO! I'M NOT ILL - WHY DO YOU ASK?
GOODNESS ME, CHILD! YOU'RE AS PALE AS A GHOST!
WHAT'S IN THAT BOTTLE, AUNTY?
SOME HOME MADE BITTERS DEARIE! THEY'LL BUILD YOU UP AND MAKE YOU STRONG!
?
CASPER! THROW THOSE BITTERS OUT THE WINDOW! OF COURSE I'M PALE UNTIL I PLASTER ON SOME ROUGE AND POWDER!
HOLD YOUR HORSES TOOTS! POOR AUNT SUSIE'S FROM THE FARM! SHE DON'T KNOW YOU USE POWDER AND SHE NEVER HEARD OF ROUGE!
OH! AIN'T THEM BITTERS WONDERFUL? YOU LOOK LIKE A DIFFERENT GIRL! JES' LOOK AT YOUR ROSY CHEEKS!
YOU'LL HAVE TO GIVE ME THE RECIPE, AUNTY!
T-TOH
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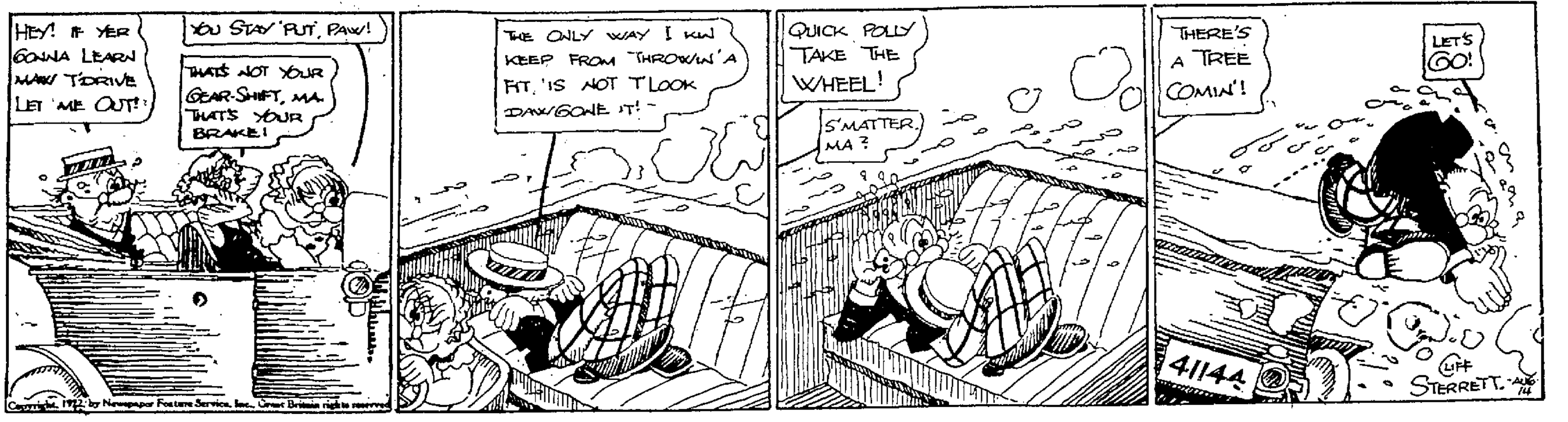
JIMMY MURPHY

POLLY AND HER PALS—That's the Way It Looked to Ma


HEY! IF YER GONNA LEARN MAW T'DRIVE LET ME OUT!
YOU STAY 'PUT', PAW!
THAT'S NOT YOUR GEAR-SHIFT, MA. THAT'S YOUR BRAKE!
THE ONLY WAY I KIN KEEP FROM THROWIN' A FIT, IS NOT T'LOOK DAW-GONE IT!
QUICK POLLY TAKE THE WHEEL!
S'MATTER, MA?
THERE'S A TREE COMIN'!
LET'S GO!
41144
CLIFF STERRETT
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THE DOO DADS—Strange But True By ARCH DALE

THE DOO DADS
HELLO NICHOLAS, OLD SPORT! HOW ARE YOU ANYHOW?
BIFF
GEE WIZZ- MR GROUCH-WHY THE ABUNDANCE OF GOOD SPIRITS? YA MUST BE FEELING GOOD TODAY-HUH?
BET-CHER-LIFE! I'VE JUST SPENT SEVEN DAYS IN THE COUNTRY-FEEL FIT AS A FIDDLE-STRONG AS A HORSE!
S'FUNNY- SEVEN DAYS IN THA COUNTRY SHOULDN'T MAKE ONE FEEL STRONG!
WHY NOT? WHY SHOULDN'T IT?
'CAUSE SEVEN DAYS MAKES ONE WEEK!
ARCH DALE

10,000 Vets Will Attend 32nd Reunion

"More Rooms" Is Plea Of Executive Board Today

Advance reports from all parts of the mid-west indicate that more than 8,000, possibly, 10,000, veteran sof the 32d Division will attend the reunion here Aug. 26 to 29, the citiezns' executive committee announced today. A goal of 10,000 has been set and provisions are being made for that number.

Col. Charles E. Sammond, Milwaukee, 105th cavalry, and formerly with the 120th field artillery, attended the executiveh committee meeting yesterday and reported 400 members of the 120th field artillery would be present. He declared tha t2,000 vets would attend from Milwaukee alone.

2 Firemen Hurt, 35 Overcome As Pier Burns

NEW YORK—Thousands of tons of freight were destroyed, two firemen were seriously injured and 35 others were overcome in fighting a blaze at pier D of the New York Central railroad. Tugs and fireboats aided the land apparatus of the fire department. Damage by mid-afternoon was estimated at $1,000,000.

Kin Of Chief Oshkosh Held As Auto Robber

MILWAUKEE, Wis. — Rolland Oshkosh, 22, an Indian, who claims to be the great grandson of Cheif Oshkosh, after whom the city of Oshkosh was named, was brought to Milwaukee by Frank Smith, deputy U. S. marshal, on the charge of stealing an automobile. Oshkosh is alleged to have stolen the machine from another Indian at Neopit, on the Menominee reservation, where he lives. He drove the auto, 120 miles to Goodman, where he was arrested. He was bound over to grand jury under $500 bail. Oshkosh attended the Carlisle Indian school for two years.

Chicago Man Is Held After Wausau Shooting

WAUSAU, Wis.—Frank Harmer, of Chicago, waived a preliminary examination on the charge of second degree murder and was held on $1,500 ball to trial in circuit court. Harmer admits shooting and fatally wounding John Thor of Marshfield at Marathon Park here on the night of July 28, in the belief that Thor was stealing his automobile, the two cars being similar.

Negro With Noose On Neck Saved From Mob

VINITA, Okla. — A mob intent on lynching Elias Ridge, a young negro alleged to have stabbed Mrs. George Adair to death in her home near here, was frustrated by Sheriff John Ridenhour. When the mob stormed the county jail Ridenhour slipped the negro out and drove him to Claremore. The mob had already selected the tree for the hanging and the rope was ready.

The spirit of unrest is often the shade of a departed thought.

Read Capital Times Want Ads.

Democrats In House Seek Ford Offer Vote

WASHINGTON — Democratic leaders in the House intend, when it reassembles Tuesday, to renew their efforts to force an agreement upon a date for a vote on Henry Ford's proposal to lease and purchase Muscle Shoals.

Bandits In Uniform Rob Store Of $8,000

ST. LOUIS — Two bandits in army uniform held up the jewelry store of Jacob Krupin and escaped with $8,000 in diamonds and $470 in cash. The bandits forced Krupin and a customer into a rear room of the shop.

Boy 13, Sentenced Two Years, Given Parole

JEFFERSON CITY, Mo.—Bruce Miller, 13, who was sentenced to serve two years in a reformatory for being an accessory in a robbery, was paroled today by Governor Hyde.

A rat in the trap is worth two in the barn.

WHO WILL BE CHAMP IF DUNDEE WHIPS FRUSH?

WHO'LL be featherweight champion if Johnny Dundee licks Danny Frush when that pair meet Aug. 17, as they are supposed to now?

Who'll be the king of that division if Danny Frush scores a clean-cut point victory or a knockout over the Scotch-Wop fighter?

Answer—Johnny Kilbane.

The fight ought to be a good one. Both boys are rugged, scientific, fast, aggressive little fighters. Both boast of large and enthusiastic followings. Both are internationally known and all that.

But to my mind the fight won't mean anything.

Supposing Dundee wins.

Dundee now is recognized as the featherweight champion by the New York state boxing commission, which decided that because Johnny Kilbane wouldn't come at the whistle of New York promoters he was no longer king. But the commission's unique decision has no weight outside New York. There is no data on which to base an expert opinion that Dundee is Kilbane's master. Dundee, it is true, fought a draw with Kilbane years ago, but that doesn't qualify him for the title now.

He was made champion by the commission because he now is popular, in demand and willing to fight for New York promoters.

Not only has he no valid claim to the feather title but there is grave doubt as to whether he is a featherweight. You may recall that a few months ago he was made champion of a new division—the junior lightweight class—to defend that title at 130 pounds. If he still is a legitimate feather why did he want to climb eight pounds out of his class to tackle heavier lads?

A victory over Frush will bear no weight. Kilbane wiped up the floor with the former Baltimore lad who moved his home to Cleveland after the fight with Kilbane. Unless Dundee wins a knockout victory over the Jewish lad in less [illegible] rounds Dundee will lessen his claim to the feather title [illegible].

Now if Danny Frush wins.

He will no doubt be crowned feather champion by the New York officials. And his greatest claim to fame, outside of that of licking Dundee, will be that he was knocked out by Kilbane in the seventh round. With that incident still fresh in the minds of fans all over the country is it reasonable to believe that he will be received generally as the new champion?

And, anyhow, will they be fighting at the featherweight limit? No. Then how come all this talk about them fighting for the featherweight championship—let alone the one that a third man who won't be in the ring, has a right to wear until he voluntarily lays it aside or offers it to be knocked off his gray hair?

Mere bunk.

But as a plain, ordinary, rip snorting fight it ought to be a good one. We repeat that.

* * *

Humor was injected into the first day's play of the western amateur golf tournament at Kansas City this summer. Hugh Hale, a Mission Hills golfer, drove off the tee, the ball landing in the bag of another player's caddy. Bergolte of Hillcrest drove a ball into the pocket of another player.

"Didn't my ball hit you?" inquired Bergolte.

"Yes, I think I felt it but blamed if I know where it went," was the reply.

The pocket was the last place to be searched.

The Club Standings

SUNDAY'S RESULTS.

American Association.
Louisville 9, Milwaukee 4.
St. Paul [illegible], Columbus 4-0.
Minneapolis [illegible], Toledo 2-7.
Indianapolis [illegible], Kansas City 1.

American League.
Washington 3, New York 2.
Chicago 9, St. Louis 3.
Cleveland 3, Detroit 2.
No other games scheduled.

National League.
Brooklyn 3, Philadelphia 2.
New York 4, Boston 2.
Cincinnati 5, Pittsburg 4.
Chicago 16, St. Louis 5.

MONDAY'S SCHEDULE.

American Association.
Milwaukee at Louisville.
Kansas City at Indianapolis.
Minneapolis at Toledo.
St. Paul at Columbus.

American League.
Cleveland at Philadelphia.
No other games scheduled.

National League.
Philadelphia at Pittsburg.
[illegible] at St. Louis.
No other games scheduled.

TEAM STANDINGS.

American Association.

	W.	L.	Pct.
St. Paul	73	43	.630
Minneapolis	65	51	.560
Indianapolis	64	51	.557
Milwaukee	66	54	.550
Kansas City	59	59	.500
Louisville	58	59	.496
[illegible]	42	76	[illegible]
Columbus	42	76	.356

American League.

	W.	L.	Pct.
St. Louis	65	44	.596
New York	65	48	.586
[illegible]	59	52	.532
[illegible]	56	53	.514
Cleveland	58	55	.513
Washington	52	56	.481
Philadelphia	42	63	.400
Boston	41	67	.380

National League.

	W.	L.	Pct.
New York	65	44	.596
St. Louis	64	46	.580
Pittsburg	58	48	.547
Chicago	59	49	.546
Cincinnati	59	53	.527
Brooklyn	52	56	.481
Philadelphia	37	64	.366
Boston	35	69	.237

Read Capital Times Want Ads.

Johnson Now City Barnyard Golf Champ

Earns Title By Defeating All Comers At Local Flasher Meet

BY RAY BUELLESBACH.

Seymour Johnson is the city's "barnyard golf" champion. At least that is the title with which the boys at the French Battery Carbon Co. horseshoe tournament hailed him Saturday afternoon, after he had defeated the best in the city and had been awarded the first honor prize.

After playing 13 games and losing only one of that number he well deserves his title. George Anderson, another well known pitcher, was the only man that defeated Johnson in the race for honors at the French athletic field. Anderson has the distinction of making 8 ringers in that one game with Johnson.

There were 674 ringers thrown in the last day of the French Battery tournament.

Prize winners of the meet were: 1st prize—Seymour Johnson; 2nd—George Anderson; 3rd—O. J. Peterson; 4th—Lavern Bergan; 5th—Martin Loftsgordon; 6th—Wilbur Sachtjen; 7th—John Kelly; 8th—Frank Kleinheinz.

The summaries of the final day were:

ROUND 1.

Martin Loftsgordon and George Anderson, 21 to 10; ringers, 5 and 4. S. J. Johnson and F. J. Kleinheinz, 21 to 11; ringers, 4 and 2. J. Kelly and Ted Peterson, 21 to 15; ringers, 4 and 2. O. J. Peterson and O. G. Stintzi, 21 to 10; ringers 5 to 3. Wm. Bostead and L. S. Lunder, 21 to 4; ringers, 2 and 1. H. W. Sachtjen and M. E. Boie, 9 to 21; ringers, 0 and 5. Levern Bergan and W. Sachtjen, 21 to 11; ringers, 3 and 2.

ROUND 2.

Lavern Bergan and Wm. Bostead, 21 to 10; ringers 5 and 2. H. Sachtjen and L. S. Lunder, 21 to 20; ringers 2 and 3. S. J. Johnson and Martin Loftsgordon, 21 to 16; ringers, 8 and 6. George Anderson and Peterson, 21 to 6; ringers, 7 and 2. Ted Peterson and F. J. Kleinheinz, 21 to 16; ringers, 5 and 4. W. Sachtjen and O. G. Stintzi, 21 and 8; ringers; 4 and 1. John Kelly and M. E. Boie, 21 to 4; ringers, 7 and 1.

ROUND 3.

H. W. Sachtjen and O. G. Stintzi, 21 to 17; ringers, 3 and 2. Martin Loftsgordon and F. Kleinheinz, 21 to 5; ringers, 5 and 1. L. S. Lunder and M. E. Boie, 21 to 6; ringers, 5 and 0. W. Sachtjen and Wm. Bostead, 21 to 16; ringers, 6 and 5. George Anderson and John Kelly, 21 to 16; ringers, 5 and 5. S. J. Johnson and O. J. Peterson, 21 to 13; ringers, 6 and 4. Lavern Bergan and Ted Peterson, 21 to 5; ringerh, 6 and 0.

ROUND 4.

S. J. Johnson and John Kelly, 21 to 5; ringers, 8 and 4. W. Sachtjen and L. S. Lunder, 21 to 5; ringers, 6 and 4. Geo. Anderson and O. J. Peterson, 21 to 6; ringers, 7 and 2. Lavern Bergan and H. W. Sachtjen, 21 to 6; ringers, 6 and 1. Martin Loftsgordon and Ted Peterson, 21 to 12; ringers, 5 and 0. Wm. Bostead and M. E. Boie, 21 to 20; ringers, 5 and 4. F. Kleinheinz and O. G. Stintzi, 21 to 11; ringers, 6 and 1.

ROUND 5.

Ted Peterson and W. Sachtjen, 21 to 20; ringers, 2 and 4. Geo. Anderson and O. G. Stintzi, 21 to 5; ringers, 6 and 0. F. Kleinheinz and Lavern Bergan, 21 to 9; ringers, 6 and 4. S. J. Johnson and L. S. Lunder, 21 to 12; ringers, 6 and 5. M. E. Boie and O. J. Peterson, 21 to 11; ringers, 5 and 3. Martin Loftsgordon and John Kelly, 21 and 19; ringers, 4 and 5. Wm. Bostead and H. Sachtjen, 21 to 14; ringers, 4 and 3.

ROUND 6.

Geo. Anderson and L. S. Lunder, 21 to 10; ringers, 7 and 4. W. Sachtjen and F. Kleinheinz, 21 and 14; ringers, 5 and 2. Wm. Bostead and O. G. Stintzi, 21 and 5; ringers, 6 and 1. O. J. Peterson and Martin Loftsgordon, 21 and 5; ringers, 5 and 2. S. J. Johnson and H. Sachtjen, 21 to 16 ringers, 5 and 4. Ted Peterson and M. E. Boie, 21 and 19; ringers, 3 and 4. John Kelly and Lavern Bergan, 21 to 16; ringers, 3 and 1.

ROUND 7.

Wm. Bostead and John Kelly, 21 to 5; ringers, 4 and 1. S. J. Johnson and Ted Peterson, 21 to 8; ringers, 6 and 1. Peterson and H. S. Sachtjen, 21 to 12; ringers, 4 and 2. W. Sachtjen and M. E. Boie. 21 to 12; ringers, 3 and 1. Lavern Bergan and L. S. Lunder, 21 to 10; ringers, 3 and 3. George Anderson and F. Kleinheinz, 21 to 15; ringers, 5 and 4. Martin Loftsgordon and O. G. Stintzi, 21 to 7; ringers, 4 and 0.

ROUND 8.

F. Kleinheinz and H. Sachtjen, 21 to 18; ringers, 4 and 4. L. S. Lubder and Martin Loftsgordon, 21 to 8; ringers, 2 and 3. Lavern Bergan and M. E. Boie, 21 to 4; ringers, 6 and 1. John Kelly and O. G. Stintzi, 21 to 4; ringers, 6 and 1. O. G. Peterson and Peterson, 21 to 0; ringers, 5 and 0. S. J. Johnson and W. Sachtjen, 21 to 1; ringers, 7 and 2. Geo. Anderson and M. E. Bostead, 21 and 13; ringers, 3 and 2.

ROUND 9.

S. J. Johnson and M. E. Boie, 21 to 15; ringers, 5 and 3. G. Anderson and Lavern Bergan, 21 to 0; ringers, 6 and 1. W. Sachtjen and H. Sachtjen, 21 to 17; ringers, 5 and 4. L. S. Lunder and F. Kleinheinz, 21 and 20; ringers, 4 and 5. M. E. Bostead and Martin Loftsgordon, 21 to 16; ringers, 5 and 4. John Kelly and O. J. Peterson, 21 to 14; ringers, 5 and 3. O. G. Stintzi and Ted Peterson, 21 to 5; ringers, 5 and 0.

ROUND 10.

Ted Peterson and L. S. Lunder, 21 to 17; ringers, 1 and 3. F. Kleinheinz and M. Wm. Bostead, 21 to 9; ringers, 5 and 2. S. J. Johnson and O. G. Stintzi, 21 and 3; ringers, 4 and 0. O. J. Peterson and Lavern Bergan, 21 to 6; ringers, 5 and 0. Geeo. Anderson and W. Sachtjen, 21 to 9; ringers, 8 and 2. Martin Loftsgordon and M. E. Boie, 21 to 13; ringers, 5 and 1. John Kelly and H. Sachtjen, 21 to 17; ringers, 5 and 2.

ROUND 11.

Martin Loftsgordon and H. Sachtejn, 21 to 19; ringers, 3 and 2. S. J. Johnson and Lavern Bergan, 21 to 2; ringers, 4 and 0. John Kelly and F. Kleinheinz, 21 to 11; ringers, 5 and 3. M. E. Boie and George Anderson, 21 to 16; ringers, 6 and 2. L. S. Lunder and O. G. Stintzi, 21 to 14; ringers, 3 and 1. Ted Peterson and Wm. Bostead, 21 to 12; ringers, 0 and 1. O. J. Peterson and W. Sachtjen, 21 to 10; ringers, 5 and 3.

ROUND 12.

O. J. Peterson and Wm. Bostead, 21 to 12; ringers, 3 and 3. L. S. Lunder and John Kelly, 21 to 15; ringers, 3 and 4. Martin Loftsgordon and W. Sachtjen, 21 to 16; ringers, 5 and 5. W. Sachtjen and Ted Peterson, 21 to 18; ringers, 3 and 4. F. Kleinheinz and M. E. Boie, 21 to 18; ringers, 6 and 5. Lavern Bergan and O. G. Stintzi, 21 to 5; ringers, 5 and 0. George Anderson and S. J. Johnson, 21 to 15; ringers, 8 and 5.

ROUND 13. (THE FINAL ROUND.)

W. Sachtjen and John Kelly, 21 to 14; ringers, 7 and 5. M. E. Boie and O. G. Stintzi, 21 to 8; ringers, 5 and 1. O. J. Peterson and L. S. Lunder, 21 to 14; ringers, 8 and 4. Lavern Bergan and Martin Loftsgordon, 2 1to 10; ringers, 6 and 3. George Anrdeson and H. Sachtjen, 21 to 0; ringers, 6 and 1. S. Johnson and Wm. Bostead, 21 to 12; ringers, 4 and 3. F. Kleinheinz and Ted Peterson, 21 to 11 ringers, 5 and 0. Tie for eighth place. F. Kleinheinz and Wm. Bostead, 21 to 11; ringers, 5 and 2.

Madison Hands Dubuque White Sox Second Defeat, 5 To 4

Lineup Shift Aids Madison Bat Average

Stinzi Makes Great Showing After Running Wild At the Start

By RAY BUELLESBACH.

For the second time within six weeks the local nine defeated the Dubuque White Sox here on Sunday by a 5 to 4 marking.

The Madison lineup was shifted and this made it possible for the locals to hit better than before. The reason was to better Carroll's hitting, and it sure did, as he sunk into Forkus for three singles.

"Zip" Stintzi, French pitcher, took the mound and made a great showing against the visitors. Zip was a little wild in the beginning as he hit four men but he improved after the third inning. Gorman, the new second base man, is there. He isn't as good as Carroll was but wait until he gets acquainted with the ways of the team and then see how he goes.

The Sox got the jump on the locals in the third inning but didn't hold it long after Peterson and Carroll got to the plate the second time. "Red" walked and Carroll beat out his first hit in the game. Berigan did the same and Peterson and Carroll beat their heels home. Berigan advanced to second but died there.

The men to come over the plate first for Dubuque were Frokus and Young, neither getting on base on a hit. In the third, the Sox came up and put two men over the plate, Sclander and McDonough. Sclander was hit by a pitched ball. McDonough sent out a double and brought Sclander in from first. Young singled and enough time was wasted for McDonough to score.

The score stood that way until the seventh until Madison again tied the River team. Gannon went out to the shortstop on a bunt fly. Stintzi was walked. Peterson went out to the shortstop. Carroll laid down a two bagger and brought Stintzi in. Berigan singled and Carroll scored. Berigan again died on the sack. Stintzi held the visitors to one hit in the first of the ninth inning and no runs. The score was still a tie and Madison had their last bat. Stintzi struck out. Peterson singled. Carroll singled and stole second while the pitcher looked at him and had the ball besides. He was all excited as it was the tightest ball gam he pitched. He put over four straight balls as he remembered Roy but he didn't know Rice as the local sent a fast grounder between short and second. Peterson came home and so did the crowd as the game was over.

This Tuesday the Madison team will play the Colored Giants in a field day program at Black Earth. La Hail and "Smiley" Smith will compose the battery for the local team. Horney and Coleman will probably battle for the Gilkerson team. The game will begin at 2 p. m. Marty of New Glarus will be umpire.

The summaries yesterday:

Madison (5)	AB	H	PO	A	E
Peterson ss	4	1	0	3	0
Carroll 3b	4	3	0	0	0
Berigan cf	4	3	2	0	1
Garvey c	2	0	0	1	0
Kleimheinz 1b	4	0	8	1	0
Martin cf	2	0	0	0	0
Gorman 2b	4	1	4	1	0
Gannon lf	4	1	6	0	0
Stintzi p	3	0	0	4	1
Rice c	1	1	0	1	0
Totals	32	10	20	11	2

Dubuque Sox (4) AB H PO A E
AB H PO A E

Dubuque Sox (4)	AB	H	PO	A	E
Young cf	5	2	1	0	0
Meyer c	4	0	2	1	0
C. Schlueter 1b	4	1	7	1	0
L. Schlueter rf	5	1	2	0	0
Altman 3b	2	1	1	2	0
Schlander lf	3	0	3	0	0
McDonough ss	3	1	2	3	0
Palmer 2b	4	0	1	1	0
Forkus p	2	1	0	0	0
Total	32	7	19	8	0

By innings—

		R.	H.	E.
Madison—	0 0 2 0 0 0 2 0 1	5	10	2
Dubuque—	0 0 2 2 0 0 0 0 0	4	7	0

Summary—

Runs—Peterson 2. Carroll 2, Stintzi, Young Selander McDonough, Forkus. Two base hits—Carroll, McDonough. Struck out—By Stintzi 5, by Forkus 3. First on balls—Off Stintzi 2, off Forkus 5. Hit by pitcher—Stintzi 4, Forkus 1. Umpire—"Smiley" Smith. Place—Kipp field. Attendance—400. Scorer—Ray Buellesbach.

Browns Lose But Maintain Pennant Lead

Hose Chase Van Gilder From Hill In Second, Scoring Six Runs

CHICAGO — Chicago went on a batting rampage in the second inning on Sunday and drove Van Gilder from the mound after scoring six runs, and easily defeated St. Louis, 9 to 3.

Sheely started the rally with a triple. After two were out Mulligan followed with a double. Schalk was hit by a pitched ball, after which four consecutive hits and an error by Williams gave the locals a commanding lead. The Sox scored another run off Bayne and added two more on Preutt.

The Browns scored three runs off Leverette by bunching hits, but were helpless against Faber.

Their defeat, however, did not affect their lead in the pennant race, as New York, the runnerup, was defeated by Washington.

TURN BACK BRAVES

NEW YORK — The New York Giants scored their fourth straight victory on Sunday when Virgil Barnes, making his first start as a regular, turned back the Boston Braves ,4 to 2. Barnes was in trouble only in two innings, when the Braves scored their runs. Oeschger, who opposed him on the mound, twirled effectively with the exception of the fourth, when the champions tallied three runs. Frisch scored their other run in the third on Kopf's error. Groh again injured his leg in the fourth inning and was forced to retire.

REDS WIN

CINCINNATI — The Reds broke Pittsburg's winning streak of thirteen straight games on Sunday by taking a ten inning contest, 5 to 4. Couch was taken out after seven inning sand Luque allowed only one hit in the last three rounds. Morrison weakened in the seventh when the Reds tied the score, and was taken out in the eighth. Daubert led off with a three bagger in the tenth, when Yellowhorse relieved Hamilton. Daubert scoring the winning run on a hit by Fonseca.

PHILS LOSE

BROOKLYN — Brooklyn's ninth inning rally on Sunday beat Philadelphia, 3 to 2, and gave Dutch Ruether his sixteenth victory of the season. Weinert shut the Dodgers out up t othe eighth, when they bunched two hits with a pass to Johnson and an error by Fletcher for two runs. The Phillies tied the score, with two out in the ninth on Leslie's single and Henline's double. Brooklyn pushed over the winning run when D: Berry's sacrifice fly brought in Myers after George Smith had relieved Weinert.

TAME CARDS

ST. LOUIS — The Chicago Cubs made it two straight over St. Louis by walloping the locals, 16 to 5, on Sunday in a farcial contest, in which the Cardinals made seven errors. The visitors hammered three local pitchers for nineteen hits, while Aldridge held the Cardinals to three hits until the ninth inning, when he eased up. Hornsby and Mueller smashed out home runs in this session. Hollocher hit three triples. It was Hornsby's twenty-ninth homer.

YANKS DROP

WASHINGTON, D. C. — Two former Yankees, Mosgridge and Peckinpaugh, were largely responsible for Washington's 3 to 2 victory over New York on Sunday. Mosgridge kept the Yankees from scoring until the ninth and Peckinpaugh's batting in the sixth helped the locals. Manager Huggins and Witt were ordered off the field in the first inning for disputing a decision by Umpire Guthrie. Ruth was absent from the lineup as a result of an abscess operation in New York.

INDIANS UP

CLEVELAND — Cleveland won from Detroit, 3 to 2. Uhle and Dauss pitched effectively except in the fifth inning when Detroit scored its two runs on five hits and in the ninth when Cleveland scored the winning run on three singles.

BREAK WINNING STREAK

WICHITA FALLS, Tex. — The Wichita Falls club of the Texas league last to Dallas after winning 25 games straight and coming within two games of the record for straight wins.

22 HOME RUNS

HASTINGS, Neb. — Twenty home runs were among the 53 hits for a total of 122 bases made in a double header between Hastings and Lincoln in a Nebraska state league game.

CHICAGO — Al White of the Olympic Club of San Francisco, won the national A. A. U. senior fancy diving championship.

What Do Hurlers Count?

The Giant hurlers. Left to right, above: Jack Scott and Hugh McQuillan, latest additions, and Phil Douglas. Below: Art Nehf, Fred Toney and Jess Barnes.

By NORMAN E. BROWN

SINCE baseball began fans have debated almost to the point of blows the weighty question as to what part pitching plays in making or breaking a ball team.

"You gotta have good pitching to win a pennant," is the majority vote.

Right now Giant fans have a chance to see at first hand just what part pitching plays in a pennant fight. For the hurling staff which pitched the Giants to the National league pennant and world's championship last year is endangering the Giants' chances for repeating.

Last year the Giants' big four finished with the following record:

Pitcher.	Won.	Lost.
Barnes	15	9
Toney	18	11
Nehf	20	10
Douglas	15	10
Total	68	40

This crew accounted for all excepting twenty-four victories the Giants chalked up last year.

This same quartet, up to the trading of Toney recently, had done as follows:

Pitcher.	Won.	Lost.
Barnes	9	6
Toney	5	56
Nehf	15	7
Douglas	11	4
Total	40	23

Just twenty-eight victories shy of their last year's mark to date.

This means that to hit the pace they did last year the Giant regulars alone must annex twenty-eight games before the season ends while the entire stoff noses out a reasonable number.

To date Art Nehf has been the only dependable pitcher on McGraw's staff. He has hit last year's stride practically all season. Douglas has been an in and outer. Barnes has not registered wins as frequently as last year.

Toney has passed out of the picture. McGraw is hoping that Hugh McQuillan and Jack Scott, just acquired, will bolster up the staff. But McQuillan's work this year does not indicate that he can be counted on to turn the tide alone. Scott's condition is a matter of conjecture. So McGraw's problem still remains. He must whip his staff into shape if he hopes to repeat.

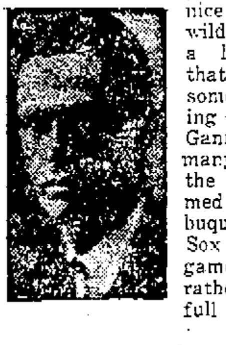
The poor showing of his hurlers has offset the improvements McGraw made in other departments—Heinie Groh, et al. The money he spent will go for naught unless he can get results from his pitchers.

All of which may be laid on the table as one answer to the query:

"What part does pitching play in a pennant drive?"

ROUNDY SAYS:

Madison Played Real Ball Yesterday With Stinzi Serving Up a Lot of Hard Work



Before the smallest crowd that h as seen a Madison team play in Zip Stinzi pitched a rather nice game. Was wild and got in a lot of holes that way but some real fielding by Lefty Gannon saved many a Sunday the locals trimmed the Dubuque White Sox 5 to 4 in a game that was rather slow but full of thrills.

* * *

him a few times from defeat.

Lefty Gannon was doing some big league fielding in the left garden yesterday. The kid played a whale of a ball game.

* * *

Old Squirt Rice was injected into the game in the fifth inning to catch and he made the local team wake up and get some "pep" in them. And Squirt lit on the old apple for the winning run with a single over short.

* * *

One thing that you can say for Stinzi is that he worked hard all the time and never showed the "quit" flag. We loved to see "Zip" win as there never was a cleaner boy than this one "Zip."

* * *

"Red" Peterson was in there playing bang up ball and got all hits his way and then some.

* * *

"Ike" Carroll got two hits. Everybody rise up and hold their hat in hand for two minutes.

* * *

Madison played good ball yesterday and the win will help the crowd next time.

* * *

There was only one place that the team was weak on yesterday that was on the bases. Some one should Manager Rubade a book on how to coach base runners at once.

* * *

Madison will play the Union Giants at Black Earth Tuesday and a big crowd from there will go to see La Hail pitch and old Smiely will handle him, some battery.

* * *

Black Earth sure has a world of credit coming for staging a day of this kind for the size of the town. That little town has some sports in it and the people out there are always trying to stage some thing that is big. They will have a parade a dance, a big ball game and fireworks.

* * *

Marty of New Glarus will umpire the games. His work of umpiring the games which the Fairies took place in was as good as the Beloit team saw this season, they said. He allows no rag chewing and hustles the teams all the time.

* * *

This column would like to make a correction. It stated that New Glarus won the water fight held this week at New Glarus. But instead Belleville Won. Thank You.

* * *

Ald. Starr was supposed to race Joe Pearson at the Elk's barbecue at Esther Beach, but Starr hoisted the "white flag" up when he saw Pearson warming up as Pearson was throwing dirt all over Esther Beach in his trails. Starr was yelling bets off far and wide.

Big John Kelly got the trimming of his life in the city horseshoe meet which ended Saturday. The big boy took his shoes down to the lake and forward passed them to about 40 feet of deep water.

* * *

Seymour Johnson copped the city title. And all the players that had the luck to meet do not want to "see-no-mour" of him while horse shoe is mentioned.

* * *

George Anderson who was doped to get first place got the second prize. He was seen sitting on the bank o fthe Yahara river thinking it over whether to leap or try his luck next year again.

* * *

Yesterday was a rather funny Sunday the Eagles or Moose did not hold a picnic.

* * *

Every baseball fan in town should see the window at Karstens' clothing store which will be done today. Get up to that window, it is the best ever shown in town in that line.

Sun Prairie Snows Under Marshall, 18-2

Walk Off With Easy Game And Tie With Middleton

MARSHALL—Sun Prairie's ball team walked away with the Marshall nine yesterday, 18-2. The Prairie boys rallied to the support of Spohn from the beginning of the first inning and continued their stride toward a heavy final score. In the fourth, fifth and sixth innings the Marshall nine held the visitors scoreless but they came back in the seventh inning with four runs. They will leave the Middleton nine and the Sun Prairie nine in the run for first honors. The box score:

Sun Prairie	AB	H	PO	A	E
Volker c	5	3	5	0	1
Finger cf	6	4	2	0	1
E. Hein ss	6	5	3	4	1
Hanson 2d	6	2	2	5	0
Tester rf	6	3	1	0	0
Spohn p	6	0	3	4	0
Edison 3d	5	4	0	2	1
H. Hein 1b	4	0	10	1	1
Hamich lf	4	0	1	0	0
Krantz lf	1	0	0	0	0
Totals	49	21	27	16	5

Marshall	AB	H	PO	A	E
S. Pyburn 2d	5	1	2	1	1
Gehler cf	4	1	3	1	0
Speis 3d	4	2	1	0	0
T. Pyburn ss	4	0	0	3	0
Meyers rf	4	1	1	1	0
Sanders 1b	3	1	8	1	1
Skalla lf	4	1	1	1	0
Powers c	4	1	10	0	1
Mills p	4	0	1	2	0
Totals	36	8	27	10	3

Sun Prairie 2 3 3 0 0 0 4 1 5—18
Marshall ...0 0 0 1 0 0 0 1 0— 2

Three base hits—Volker 1, Finger 2, Spies 1. Two base hits—E. Hein 4, Spies 1, Finger 1, Skalla 1, Hanson 1. Struck out—By Spohn 3, by Mills 8. First on balls—Off Mills 2. Double plays—E. Hein, Hanson to T. Hein. Place—Marshall. Scorer—Mitchell.

Waunakee Defeats Oregon Nine, 5 to 2

WAUNAKEE — Waunakee's ball team defeated the Oregon nine 5—2 at Waunakee yesterday afternoon.

Middleton Wins And Ties For League Honors

LODI — Middleton defeated the Lodi nine 8—4 here yesterday afternoon. This leaves Sun Prairie and Middleton tied for first honors.

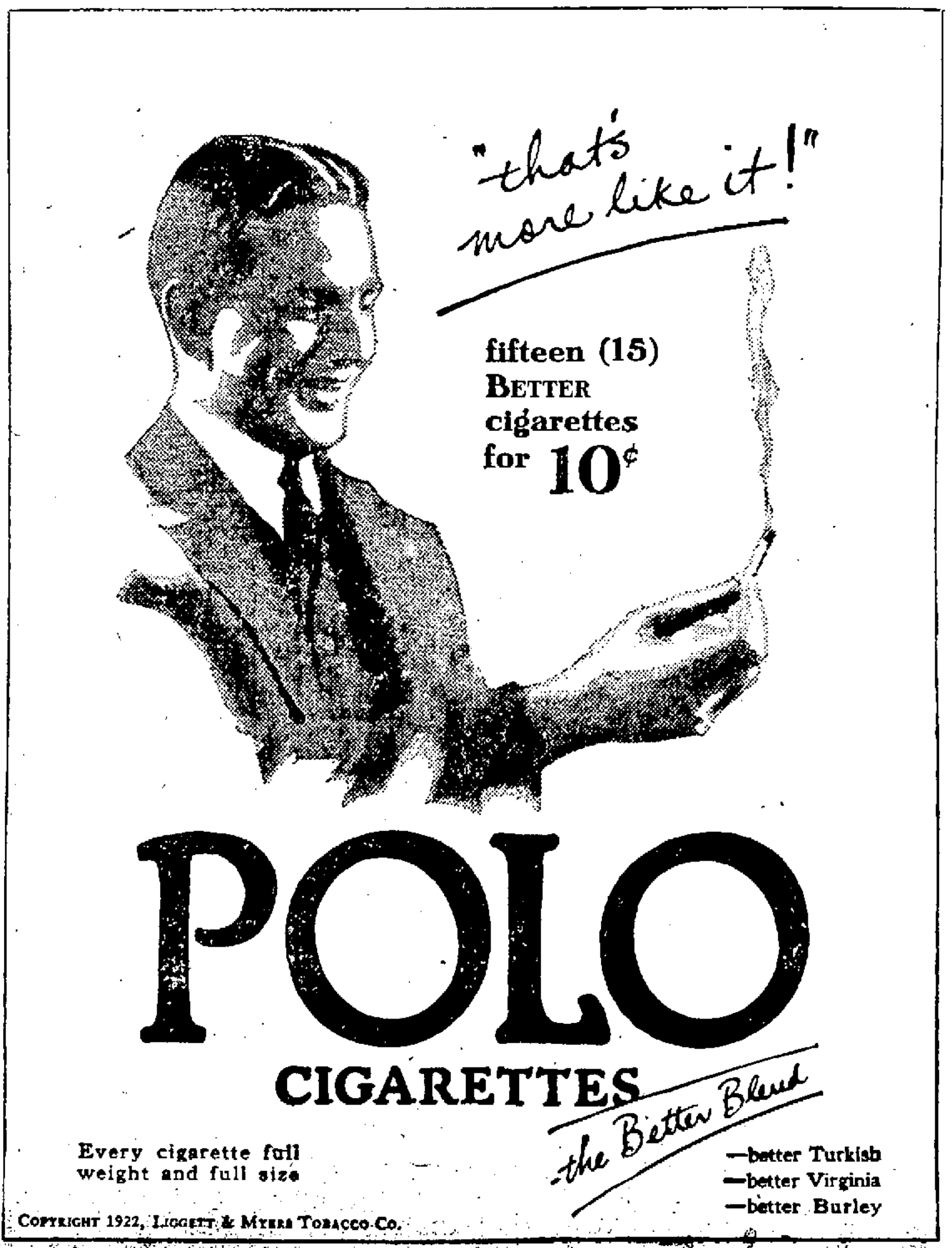
Deerfield Smothers De Forest Team 14 to 4

Deerfield — The Deerfield ball team walked away with the De Forest team yesterday afternoon, 14—4.

LOUISVILLE, Ky. — Johnny Weismueller set another world's swimming record when he swam 150 yards in 1:29 1-5. The old record of 1:33 2-5 was held by Duke Kahanamoku of Hawaii.

Stoughton Is Defeated By Racine 8 To 6

RACINE, Wis.—Jumping on big Bill Lathrop for 15 safe bingles Racine defeated Stoughton, Wis., here Sunday afternoon in a nip and tuck game, 8 to 6. Buckeye and Kernan made homeruns. The visitors found Ed Miller for 11 safe knocks.



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News of the Markets

Report for August 14, 1922

Wheat Prices Lower During Early Trading

(By The Associated Press)

CHICAGO — Wheat averaged lower in price today during the early dealings, bearish sentiment having been emphasized by a setback in Liverpool quotations and by the apparent failure of the premiers conference in London. On the declines in the market here, however, considerable buying of September wheat took place owing to rail strike developments which appeared likely to restrict arrivals of wheat at primary centers, as a consequence, september delivery showed firmness compared with later deliveries, all of which touched a new low price record for the season. The opening which varied from ¼ cent to 1 cent lower with the September 1.03¾@1.04 and December from 1.03 to 1.03⅛ was followed by a slight rally and then a fresh decline.

In later dealings, prices broke sharply, and September as well as other months dropped to a new low price record for 1922.. Hedging pressure in northwestern markets together with enlargement of the domestic visible supply total had a depressing effect. The close was unsettled 1⅝ to 2⅜ net lower with Sept. 1.01½ to 1.01⅝ and Dec. 1.02 to 1.02⅛.

CORN— Persistent coverings on the part of shorts gave firmness to corn and oats, after opening ⅛ to ⅜ cents lower to ⅛ cents advance September 58½ to 68⅛ the corn market scored moderate general gains.

Dry weather complaints from Illinois and Nebraska tended to uphold the corn market despite increased weakness of wheat. Corn closed unsettled, at 1 cent net decline to a like advance, with Sept. 57½ to 57⅝.

OATS — Oats started unchanged to ⅛@½c lower, Sept. 30¼ to 30½ and afterwards rallied all around to Saturday's finish.

PROVISIONS— Provisions were firm in line with hog values.

CHICAGO POTATOES

CHICAGO — Potatoes, steady on New Jersey weak on other stocks; receipts 22 cars total U. S. shipments 757 cars, New Jersey sacked cobblers 1.60@1.70 cwt.; East Shore Virginia barrel cobblers No. 1, 2.60@2.65; Minnesota sacked early Ohio's 1.00@1.10 cwt.; Nebraska sacked Early Ohios 90@1.05 cwt.

CHICAGO POULTRY

CHICAGO — Poultry, alive, lower; fowls 16@23; broilers 24½; Springs 27; roosters 15.

CHICAGO DAIRY

CHICAGO — Butter, higher, creamery extras 33; firsts 28½@30; seconds 27@27½; standards 33@33¼; Eggs higher; receipts 13,036 cases, firsts 20½@21½; ordinary firsts 19@19½; miscellaneous 20@20½; storage packed firsts 22½@23.

CHICAGO LIVESTOCK

CHICAGO— Cattle, receipts 16,000, beef steers steady to strong; top 10.60, bulk 8.65@10.25; better grades butcher she-stock strong to 15c higher; other grades and classes steady; bulk beef cows and heifers 5.10@7.25; canners and cutters mostly 2.75@3.65; bologna bulls largely 3.75@4.10; veal calves mostly 10.00@11.00 early. Hogs receipts 32,000, market unevenly 10 to 15c higher, few under weights on sale; bulk 175 to 195 lb weights 10.25@10.35; 200 lbs to 225 lb butchers 9.90@10.00; 230 to 250 lb butchers 9.50@9.85; good and choice 270 to 300 lb butchers 9.10@9.25; bulk packing sows 7.75@8.25; pigs scarce; bulk desirable kinds 9.75@10.00; heavy weights 8.35@9.60; medium weights 9.25@10.20; light weights 9.85@10.35; light lights 9.75@10.35; packing sows smooth 7.50@8.35; packing sows rough 7.00@7.50; pigs 9.25@10.15. Sheep receipts 11,00 mostly steady; top native lambs 12.00@12.25@ packers and city butchers; bulk natives 12.00@12.25; cull ends for slaughter largely 8.50@9.00; only nine cars westerns here; good Washingtons bid 12.50, feeders opening slow; railroad situation deterring buyers.

ST. PAUL LIVESTOCK

SOUTH ST. PAUL, Minn,— Cattle, receipts 10,900; market slow, mostly steady; common to medium beef steers 5.50@8.50; butcher cows and heafers mostly 3.50@5.00 top grass fat heifers 7.00; canners and cutters largely 2.25@3.25; bologna bulls mostly 3.00@3.50; stockers and feeders slow and steady to weak; 3.50@E.50 bulk 5.00@6.50; calves receives 9.00; steady to 25c lower, bulk of best lights 9.50; seconds mostly 5.00. Hogs, receipts 4,200; market mostly steady; range 7.00@10.00; bulk 8.00@9.75; good pigs 10.00. Sheep receipts 1,800; market steady to strong; bulk good native and Dakota lambs 11.50; light and medium weight fat ewes 6.00@6.25; few lights 6.00@6.25; few light sheep, few western strong.

MILWAUKEE LIVESTOCK

MILWAUKEE, Wis. — Cattle receipts 200, steady, unchanged. Beef steers best 9.00@9.50; butcher cows and heifers 4.50@8.00; medium cows 3.50@4.25; canners and cutters 2.25@3.26 bulls 3.00@5.50. Calves receipts 200, steady veal calves bulk 10.25@11.00, top 11.00. Hogs 500, strong unchanged. Bulk 200 pounds down 9.75@10.25; bulk 300 pounds up 7.75@9.75; sheep 200 steady, unchanged. Spring lambs 300@12.00; Ewes 10.00@7.00.

MINNEAPOLIS FLOUR.

MINNEAPOLIS, Minn. — Flour 10 to 20 cents lower. In carload lots, family patents quoted at 6.75@7.20 a barrel; in 98 pound cotton sacks. Shipments 47,811 barrels. Bran 15.00.

Stock Market Reacts Due To Strike Reports

NEW YORK—Further complications in the railroad strike situation, combined with the failure of the allied premiers to come to an agreement on the German reparations question, imparted a decidedly reactionary trend to opening prices on the New York stock exchange today. The heavy selling pressure was directed chiefly against the rails and oils. Northern Pacific dropped a point, Toledo, St. Louis and Western was down ¾ and losses of large fractions were recorded in St. Paul Pfd., Rock Island, New York Central and Great Northern Pfd. Mexican Petroleums sold off a point and then dropped 3¼ below Saturday's close. Losses of a point were registered by United States Steel, Studebaker and People's Gas. Pronounced, heaviness also was noted in International Harvester, General Asphalt and some of the equipment shares. Two outstanding exceptions to the downward trend were Coca Cola and American Zinc Pfd., each of which gained a point.

Selling orders predominated in the final hour when the lowest prices of the day were registered, by steels, equipments, railroads and foreign oils, most of which were down 1 to 3 points. The closing was heavy. Sales approximated 575,000 shares.

NEW YORK STOCK LIST.

Allied Chemical & Dye	74
Allis-Chalmers	52¾
American Beet Sugar	45⅞
American Can	56½
American Car & Foundry	171½
American Hide & Leather pfd.	71½
American International Corp.	36½
American Locomotive	117½
American Smelting & Ref'g.	60¼
American Sugar	80¼
American Sumatra Tobacco	37
American T. & T.	122½
American Tobacco	149
American Woolen	90½
Anaconda Copper	52¾
Atchison	100⅞
Atl., Gulf & W. Indies	30¾
Baldwin Locomotive	122¼
Baltimore & Ohio	50¼
Bethlehem Steel "B"	78¾
Canadian Pacific	140⅛
Central Leather	40¼
Chandler Motors	58⅛
Chesapeake & Ohio	74¾
Chicago, Mil. & St. Paul	33⅛
Chicago, R. I. & Pac.	43½
Chino Copper	29
Colorado Fuel & Iron	29¼
Corn Products	113¾
Crucible Steel	90¼
Erie	16¾
Famous Players-Lasky	87½
General Asphalt	64⅞
General Electric	179
General Motors	13
Goodrich Co.	35 B
Great Northern pfd.	86¼
Illinois Central	108½
Inspiration Copper	40⅛
International Harvester	112¾
Int. Mer. Marine pfd.	64⅝
International Paper	56⅜
Invincible Oil	12⅞
Kelly-Springfield Tire	43¼
Kennecott Copper	36
Louisville and Nashville	131B
Mexican Petroleum	171¾
Miami Copper	29⅛
Middle States Oil	12⅜
Midvale Steel	34
Missouri Pacific	22¾
New York Central	96½
N. Y., N. H. and Hartford	30⅜
Norfolk and Western	114
Northern Pacific	80
Oklahoma Prod. and Ref.	2¾
Pacific Oil	52⅝
Pan American Petroleum	74⅜
Pennsylvania	45¾
People's Gas	90⅛
Pure Oil	29⅝
Ray Consolidated Copper	16¼
Reading	74¼
Rep. Iron and Steel	71⅛
Royal Dutch, N. Y.	53⅛
Sears Roebuck	92⅝
Sinclair Con. Oil	30½
Southern Pacific	91¼
Southern Railway	25⅝
Standard Oil of N. J.	177¾
Studebaker Corporation	124
Tennessee Copper	10¼
Texas Co.	46⅜
Texas and Pacific	31
Tobacco Products	78⅝
Transcontinental Oil	13¼
Union Pacific	144
United Retail Stores	65⅞
U. S. Ind. Alcohol	65½
United States Rubber	57⅜
United States Steel	100⅛
Utah Copper	65
Westinghouse Electric	61⅛
Willys Overland	6¾
C. and N W	83¾
Maxwell Motors	19¼B

CHICAGO GRAIN.

CHICAGO—Wheat No. 2 red 1.04½@1.07⅛; No. 2 hard 1.05@1.08⅛. Corn No. 2 60⅛@61¾; No. 2 yellow 62⅛@63. Oats No. 2 white 31@34½; No. 3 white 29¾@33. Rye No. 2 71⅛@71¾. Barley 48@58. Timothy seed 4.25@5.15. Clover seed 12.00@16.00. Pork nominal. Lard 10.72. Ribs 9.75@10.75.

CHICAGO GRAIN TABLE.

	Open	High	Low	Close
Wheat—				
Sept. ..	1.03¾	1.04⅜	1.01	1.01½
Dec. ..	1.03	1.03½	1.01⅝	1.02
May ..	1.07⅜	1.08⅜	1.06½	1.05⅞
Corn—				
Sept. ...	58½	59⅛	57½	57½
Dec. ...	51¼	59⅛	51⅞	52⅞
May	55½	56⅛	55½	55⅞
Oats—				
Sept. ...	30¼	30⅞	30⅛	30⅜
Dec.	32⅞	33¼	32½	32¾
May ...	36¼	36⅞	36¼	36½
Lard—				
Sept. ...	10.75	10.75	10.67	10.72
Oct. ...	10.77	10.82	10.72	10.75
Ribs—				
Sept. ...				9.87
Oct ...				9.40

MINNEAPOLIS GRAIN

MINNEAPOLIS — Wheat receipts 494 cars compared with 586 cars a year ago. Cash No. 1 Nor. 1.12@1.16; Sept. 1.05; December 1.03⅝; May 1.08¼. Corn No. 3 yellow 54½@55. Oats No. 3 white 26⅜@27⅝. Barley 40@49. Rye No. 2, 67¾. Flax No. 1, 2.44@2.46.

FINAL LIBERTY BONDS

NEW YORK — 3½s 100.92. First 4s 101.22. Second 4s blank. First 4¼s 101.20. Second 4¼s 100.56. Third 4¼s 100.52. Fourth 4¼s 101.34. Victory 4¾s uncalled 100.84. Victory called 100.48.

TOWN TALK

POSTPONE MEETING

The regular meeting of the Willard W. C. T. U. will be held Tuesday afternoon at 3 o'clock instead of Wednesday.

HAMBRECHT TO SAIL

G. P. Hambrecht, state director of vocational training, will sail for Europe on the liner Majestic Aug. 26 to study European methods of vocational training. He will be accompanied by E. Schultz, president of the state board of vocational training and by the director of the Milwaukee vocational school.

SUPPORT REINING

In a regular meeting held Aug. 7, the Madison Federation of Labor adopted a resolution to support Adam Reining for sheriff and instructed all delegates to report the same to their respective unions. Reining is employed by the Street Railway Co. as motorman.

BUILDING PERMITS

Building permits were issued today to Charles Bouchard who contemplates building a $4,000 frame residence on Union st. J. T. Icke will erect a frame residence at 111 N. Mills st. at a cost of about $4,500.

FILES BANKRUPTCY

Bankruptcy papers were filed today by Robert A. Maiers, Beloit, placing his liabilities at $1,379 with no assets. Mr. Maiers is in the meat market business at Beloit.

TOUTON RETURNS

William Touton, deputy U. S. marshal, returned from Davenport, Iowa, this noon having delivered Arnold Wulf to the authorities there Mr. Wulf was wanted on a warrant charging him with white slavery

FURNISH BONDS

All of the seven railway strikers who were arrested last Friday at Altoona furnished their bond. Bonds were placed at $500 each. The men were brought before Judge C. Z. Luse in U. S. district court late Saturday afternoon and bail fixed at this amount.

Wisconsin's Potato Crop Increases 500 Cars

An increase of 500 cars during July in the prospective potato crop of Wisconsin is shown by the August 1 report of Joseph A Becker, of the Wisconsin Cooperative Crop Reporting Service. Based upon Aug. 1 condition, the carlot movement of the 1922 crop is forecasted at 30,300 cars as compared to 29,300 forecasted on July 1, and 12,500 shipped last year

The month was favorable to the growth of potatoes. Condition of the crop in the commercial counties of the state is estimated at 93.8 per cent of normal, compared to 48.2 per cent on Aug. 1 last year.

MILWAUKEE GRAIN

MILWAUKEE, Wis. — Wheat No. 1 Nor. 1.16@1.28; No. 2 Nor. 1.11@1.23. Corn No 2 yellow 62@62½; No. 2 white 61; No. 2 mixed 60½@61 Oats No. 2 white 32@34; No. 3 white 30½@33; No. 3 white 30@32. Rye No. 2, 73. Barley malting 52@59; Wisconsin 53@59; feed and rejected 48@50. Hay steady No 1 timothy 17.00@18.50; No. 2 timothy 15.00@16.00.

MADISON RETAIL PRICES.

Quotation furnished by Provision Market Co., 119 W. Main st.:

Strictly fresh eggs	27c
Cream, per half pt. (coffee)	13c
Cream, whipping per half pt.	20c
Sugar, per lb	9c
Butter per lb	38c
Oranges, doz.	60@70c
Bananas per lb	5c
Apples per lb	5—8c

PRODUCE.

Quotations by Universal Grocery Co.:

Following is the wholesale price of produce to Madison merchants in Madison Monday were:

Bananas, per cwt.	6—6.50
Lemons, per case	6.50
Grape fruit, per case	
Celery, per doz, ex Jumbo	1.25
Potatoes per cwt.	1.40
Cal. Navals	11.50
Apples (bushel)	1.00

MADISON LIVESTOCK.

Quotations furnished by Oscar Mayer Packing Co.

The wholesale prices of livestock in Madison Monday were:

Medium Heifers	4.00@5.00
Canners	2@2.50
Cutters	2.50@3.50
Bologna Bulls	3.00@3.50
Butcher Bulls	3.50@4.00
Medium to good cows	3.50@4.75
Calves	6@11.00
LAMBS.	
Lambs	6@11:00
HOGS.	
Hogs, bulk of sales	9.50@10.15
Heavy butchers	8.25@9.00
Packing sows	7.00@7.30

POULTRY AND VEAL MARKET.

Wholesale prices on live poultry in Madison Monday were:

Chickens, per lb. dressed	22c
Chickens, alive	18c
Veal	10@12½c

Read Capital Times Want Ads.

Cannibals Inventors of Turkish Bath, Says Singer

Frances Arms, Thru English Melody Traces Witch Doctor Ritual to Present Day Institution

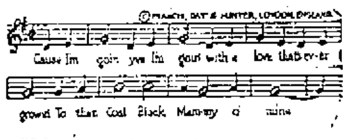
NEW YORK CITY—The well-known Turkish bath, dear to the heart of the over-plump, isn't really Turkish but African if you trace it back to its origin, Frances Arms, pretty ballad singer, surprisingly announces.

Miss Arms, who is strong on history and also the owner of a remarkable collection of ancient and priceless parchments, got interested in the Turkish bath discussion through "Coal Black Mammy," a ragtime song, which she sings and declares to be the dancingest, shufflingest melody she has ever heard.

English Composer

The composer of "Coal Black Mammy," contrary to all tradition is not American, but an Englishman, Laddie Cliff. Mr. Cliff, also a historian, went back for the theme of his song to these original African strains as played on the national marimba:

"And in the haunting, rousing syncopation of 'Coal Black Mammy,' that, danced by the natives, throws the whole tribe into a frenzy of perspiring, steaming ecstasy, we have the very first Turkish bath ever invented." Miss Arms relates gleefully. "In this new song for the woman bent on banting are the very strains that the African witch doctors use to cure patients of all ills, see:


© MARCH, DAY & HUNTER, LONDON, ENGLAND
Cause im goin yes im goin' with a love that's ev-er
growd To that Coal Black Mammy o' mine

"These seemingly miraculous cures are worked by the Turkish bath theory of getting the patients wrought up and overheated so that they perspire freely, eliminating poisions and extra pounds simultaneously."

Public Health Officers Hold Meeting Here

Biennial Convention Of Public Health Officers And Nurses

TUESDAY'S PROGRAM, 9 A. M.

Address of welcome, Gov. Blaine.

Control of Diphtheria, Dr. H. M. Guilford, Madison; discussion, Dr. Frank A. Southwick, Stevens Point; Dr. Frank B. Welch, Janesville.

Scarlet Fever, Measles and Whooping Cough, Dr. E. V. Brumbaugh, Madison; discussion, Dr. E. T. Ridgway, Elkhorn; Dr. L. M. Field, Beloit.

Typhoid Fever and Other Water-borne Diseases, Dr. Frank F. Bowman, epideliologist, Madison; discussion, Dr. W. W. Bauer, Milwaukee; Dr. W. W. Johnston, Racine,

Case Work in Tuberculosis, Dr. A. A. Pleyte, Wisconsin Anti-Tuberculosis association, Milwaukee; discussion, Dr. C. E. Ide. Muirdale sanatorium, Wauwatosa; Dr. C. D. Boyd, Waukauna.

1:30 p. m.—Practical Aspects of the Care of Infantile Paralysis and Other Crippling Deformities of Childhood—Dr. Chester C. Schneider, Milwaukee; discussion, Dr. A. C. Dana, Fond du Lac; Dr. W. C. Felton, Appleton.

Pneumonia and Influenza, Dr. George C. Ruhland, Milwaukee; discussion, Dr. Max Staehle, Manitowoc; Dr. S. J. McCorkle, West Allis.

Venereal Diseases, Dr. H. G. Irvine, St. Paul. Minn.; discussion, Dr. John F. Schneider, Oshkosh; Dr. V. A. Gudex, Madison; Miss Martha Riley, Madison.

The sixth biennial conference of Wisconsin health officers and the third annual conference on child welfare and public health nursing got under way this afternoon with a program in the assembly chamber. Tuesday, Wednesday, Thursday and Friday sessions, weather permitting, will be held at Monona park auditorium, and meals will be served on the grounds. Saturday morning's closing session will be held in the capitol.

Dr. C. A. Harper, state health officer, opened the meeting today with an introductory address.

C. M. Baker, state sanitary engineer, speaking on the relation of the bureau of sanitary engineering to the general public health program, sketched the progress in disease control from the time of Ponce de Leon to the present, with emphasis on the sanitary clean-up.

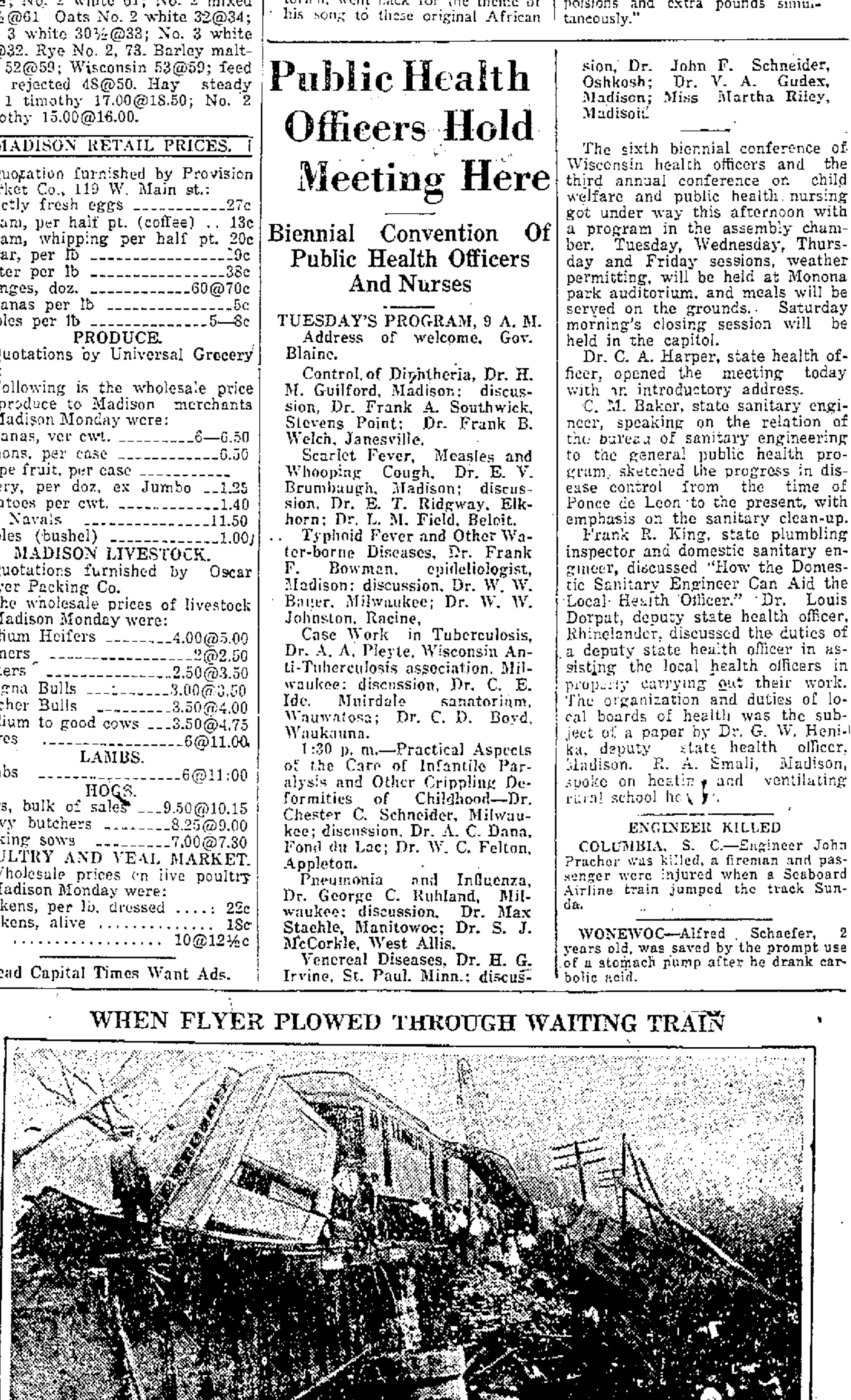
Frank R. King, state plumbling inspector and domestic sanitary engineer, discussed "How the Domestic Sanitary Engineer Can Aid the Local Health Officer." Dr. Louis Dorpat, deputy state health officer, Rhinelander, discussed the duties of a deputy state health officer in assisting the local health officers in properly carrying out their work. The organization and duties of local boards of health was the subject of a paper by Dr. G. W. Henika, deputy state health officer, Madison. R. A. Small, Madison, spoke on heating and ventilating rural school houses.

ENGINEER KILLED

COLUMBIA, S. C.—Engineer John Pracher was killed, a fireman and passenger were injured when a Seaboard Airline train jumped the track Sunday.

WONEWOC—Alfred Schaefer, 2 years old, was saved by the prompt use of a stomach pump after he drank carbolic acid.

WHEN FLYER PLOWED THROUGH WAITING TRAIN



Wreckers at work extricating dead and injured after the crash.

The engineer who went to his death with his train is blamed for the recent disaster at Sulphur Springs, Mo. Fast passenger train No. 4 on the Missouri Pacific plowed into the rear end of another passenger train, killing thirty and injuring over fifty passengers in the second train. The heavy fast train demolished the last four coaches of the train ahead. Matthew W. Glenn, an engineer with a record of thirty-four years without an accident, was guiding the [illegible]

Stoughton Department

C. J. ROLLIS, Editor

Office First Floor, 102 East Main Street. Telephone 664 W.

STOUGHTON — Co. L. 4th Inf. Wis. National Guard, is still holding its own in the various stunts, according to a card from Lieut. Olson received yesterday. Saturday there was a combat problem with live ammunition, mortors, machine guns, ribes, tanks and smoke bombs. The Co. has been given compliments by Gen. Charles King, the Author-Soldier of Wisconsin, who was wounded in the Indian wars and retired from active U. S. service.

Miss Emmah Nelson came Saturday evening from Minneapolis to visit her sister, Mrs. John Mickleson and family, Garfield St.

Mr. and Mrs. J. M. Ostlund of Pipestone, Minn., have been visitors with Mr. and Mrs. W. L. and Mr. and Mrs. E. H. Warren at Stoughton.

Mrs. Nellie McCool of Madison spent Sunday with her son, Harry McCool and family, Moline St.

Guests of Rev. and Mrs. R. H. Jones are the daughter, Mrs. John Dixon and two sons of Brandon, Wis. They arrived Saturday.

Mrs. Frederick Wellman and Mrs J. C. Yore of Chicago are visitors with Mrs. Arthur Giddings at the lake.

Mrs. Clyde Palmer came home last evening from Chicago, where she visited her brother, Wyman Warren and family for a week.

Mrs. Adolph Jacobson, South Franklin St., entertained a number of lady friends on Friday evening at her home.

Atty. E. K. Loverud, Charles Randecker, B. T. Oftelie and W. O. Havey have been enjoying a few days outing at Eagle River and doing some fishing. M. A. Kildal and family are home from the same locality.

Entertain Bridge Club

Mrs. Charles Gpelson and Mrs. C. S. Toay entertained at a 5:30 luncheon at the residence of Mrs. Guelson, South Page St., the evening being spent with bridge.

Mrs. Emil Olson entertained in honor of Mrs. Osqar Olmon of Juneau and Mrs. William Brannon of Madison.

Surprived at Lake Ripley

A dozen Stoughton ladies motored over to Lake Ripley and carried out a very successful birthday surprise on Mrs. F. M. Jensen, who is spending part of the summer with her mother, Mrs. J. H. Townsend, at the latter's cottage on the shores of Lake Ripley.

Lewis Halverson came home from Madison for a visit with his family, east side.

Nels Knudson, Omaha, Nebraska, is at Stoughton on a visit with relatives.

Mrs. Eda Roberts of Evansville was a week end visitor at the home of Mrs. Julius Johnson, East South St. and with other Stoughton friends.

Miss Jeanette Feggestad of Cambridge was an over Sunday visitotr at the home of Mr. and Mrs. Willis Johnson, North of Stoughton.

Mrs. P. J. Ringdahl, Oak St., was a Madison visitor during the week end.

Berger Hagen, who was a sergeant in the 32d Division in Europe came home Saturday for a two weeks vacation from his duties with the General Electric Company in Chicago. He graduated last year in the electrical course at the Wisconsin university, continuing his studies after returning from abroad.

The Orphans' Home

The members of the Mt. Horeb Lutheran church visited Stoughton Sunday morning and held services on the grounds of the Martin Luther Orphans Home. Rev. E. R. Anderson spoke in English at 11 a. m. The object of this meeting was to interest the members of the Mt. Horeb Lutheran church in the work being done at the Home.

Miss Nora Mathison and nephew Norris Linderud, are visitors with Mr. and Mrs. Mathew Rasmusson, in Beloit this week.

Mr. and Mrs. S. Gullian of Detroit, Michigan are visitors with her father, C. J. Melaas, president of the Melaas-Johnson Co. and they will spend some time at the lake.

Julius Visaas, wife and son and Mrs. Jay Hunt, who spent a week at Stoughton with his brother, Albert Visaas, North Madison St., and other relatives, left Saturday on their return to St. Paul, motoring by way of Milwaukee and Appleton.

Mr. and Mrs. Bottolf Bricksmoen motored to Beloit yesterday, where they attended the dedication of the new Lutheran church and also visited her brother, Dr. Wilber Melaas and family in that city.

The committee of Spring City Encampment No. 43, Waukesha, has already started sending out announcements of the Grand Encampment to be held in that city on Oct. 9, 10 and 11.

Eli Bratvold and family came over from Oregon for a week end visit with Stoughton relatives. Theodore Stenjem of Madison spent Saturday in Stoughton. E. B. Ellingson of Edgerton was a Stoughton visitor.

Abe L. Severson, East Main St., is having a two weeks vacation from his duties on the road in Wisconsin for the Royal Exchange Assurance Co. of London, England. He is state agent for Wisconsin.

Sven Rosendahl of Madison spent Sunday with his mother, Mrs. Sarah Rosendahl, Dunkirk avenue.

The ladies of the Saviours Lutheran church will have an ice cream social at the home of Mr. and Mrs. Antone Jenson, 5 miles S. W. of Stoughton, on Tuesday evening.

Mr. and Mrs. Gus Oberg and children have been Madison visitors. Mr. and Mrs. C. F. Downey of South Dunkirk are spending a week with friends at Perry, Iowa.

Miss Agnes Boyer of Daggett, Michigan, has been entertained by Mr. and Mrs. W. E. Stack, South Madison St.

Mrs. Lester Eberle and daughter have been visitors with relatives in Whitewater.

Miss Nana Blankett, here from England, a guest of Miss Lundeberg of Deerfield, Miss Bernice Allen of Oshkosh and Miss Lundeberg spent Saturday with friends in Stoughton. Miss Lundeberk was formerly one of the two supervising teachers in the First District of Dane county, but was compelled to resign owing to the illness of her mother.

To Entertain Ladies' Aid.

The Ladies' aid of Rev. G. G. Krostu's church will be entertained at the church basement, Thursday, Aug. 17, by Mrs. A. H. Holtan, Mrs. George Holtan, Mrs. A. Norgaren.

Martin Munson and family entertained about 78 relatives and friends at Munson's Grove on the northeast shore, a fine shady spot and there was a picnic dinner, games, foot races and a jolly good time.

Mrs. A. S. Thompson went to Edgerton Saturday and in company with the mother proceeded to Wales, Wis., yesterday, where a sister of Mrs. Thompson is receiving treatment.

Two motor trucks were utilized Saturday in conveying the local base ball team to Racine, where it had a game yesterday. The drivers of the trucks were Alvin Nettum and Harry Wright.

Mrs. Ella Garey and son have returned to Edgerton after a week's visit with her sister, Mrs. Fred Schroede, Jr., and husband, South Madison St.

Mr. and Mrs. W. E. Stack entertained over the week end Mr. and Mrs. Wiliam Whalen of Madison and Miss Aileen Stack of Arkansas.

Theodore Flom and family arrived from Madison yesterday to spend a week in the Groven cottage, Camp Columbia, in company with Olous Felland and family of Stoughton.

High water at Kegonsa is gradually receding and shore conditions are improving. The fish now being caught consist mostly of perch.

Mr. and Mrs. H. W. Scott are entertaining Mr. and Mrs. Albert Brohead of Desota, Wis., at their cottage in Crystal Springs Park.

Fritz Scheldrup of the Poynette neighborhood, where he owns a farm, was a week end visitor at the home of Mr. and Mrs. H. F. Schumacher, East North St.

Mrs. Einer Mellum and two daughters and Mr. Carl Appel of Minneapolis, arrived overland to be visitors with Adolph Mellum and family, 402 West South St. They came yesterday.

Miss Clara Lintvedt of Edgerton has been a guest of Mrs. J. H. Bjoin and family, Church St.

P. H. Kvitle and family, Ridge St., attended the wedding of a sister of Mr. Kvitle at Cambridge Saturday.

George Schultz, cashier at the depot, went to Rome, Wis., Saturday to visit his parents over Sunday.

Miss Hazel Vingom came from Madison for the week end to visit her parents, Mr. and Mrs. M. J. Vingom, East South St.

Funeral of Mrs. S. O. Hougen.

There was a large attendance at the funeral of Mrs. S. O. Hougen, held from the Central Lutheran church Saturday afternoon, many being present from the old home in Rutland township. Rev. Oscar Thompson conducted the funeral service on Saturday. The interment was made at the East Side cemetery, where the family has owned grounds since the early days. During her illness Mrs. Rougen lived with her daughter, Mrs. Selmer Jordahl, and husband in the Pleasant Hill addition to Stoughton. The pall bearers Saturday were Ben Lewis, Nels Houg, Stoughton; O. Sveom, Rutland; A. T. Sandsmark, Pleasant Hill; P. S. Peterson, Rutland, and Hans Lund.

Ben Lewis has returned to Stoughton from a visit of a couple of weeks with his son and family at Oregon.

Mrs. J. E. Duer is spending a couple of weeks with relatives in Minneapolis.

Mrs. L. C. Dean of Chicago has been visiting her parents, Mr. and Mrs. Lewis Rasmusson, South Fourth St.

Miss Marie Grane, deputy clerk of the court, was a week end visitor with her mother, Mrs. L. Mr. Grane, East North St.

Clem W. Crumb, pas grandmaster of the Odd Fellows, will be in attendance this evening upon the meeting of Social Lodge No. 60 of that order; and there will be others from outside points. Donations to the Orphans Home at Green Bay will be discussed. It is expected $90,000 will be expended for improvements at the home within the next two years. Fred Jennings, district president of the Odd Fellows of Rock County, will accompany Mr. Crumb this evening. Past Grandmaster Crumb telephoned that he would like the initiatory degree put on by the lodge this evening.

Miss Marion Leitch of Ripon is a visitor with Mr. and Mrs. E. B. Duncan, West Washington St.

Boy Scouts to Lake Ripley.

About twenty boy scouts were taken across country by a motor truck belonging to the Heddles Lumber Co., Saturday for an outing at Lake Ripley, with Ingvald Fagerland, scoutmaster, in charge.

Regular meeting of the Daughters of the G. A. R. this evening at 7:30. All members are urged to be present as there is important business.

Mrs. Earle Townsend entertained a number of friends at her home on Garfield St., for Mrs. Stephen Severson, a visitor at Stoughton from Eldorado, Kansas.

Mrs. Chester Warren is home from a month's stay at the Methodist hospital in Madison. She will later have an operation for goiter at the same hospital.

Mr. and Mrs. William Nalon of Hampon, Iowa, are visitors with Stoughton relatives.

Mr. and Mrs. Charles Hvam were Sunday visitors with Carl Hvam and family in Beloit. Harold Lee of Medford, Wis., have been spending a few days with Stoughton friends. He is the son of Rev. J. J. Lee, Lutheran pastor at Radcliffe, Iowa.

Rev. A. Van Eldon of Joplin, Mo., has been a visitor with Dr. and Mrs. W. G. Pargeter, North Page St.

Mr. and Mrs. Ray Engle of Milwaukee have been visitors with Mr. and Mrs. Erick Aaberg, Forton St.

Watertown Bus Overturns at Sun Prairie

Driver, Lone Occupant, Is Injured As Heavy Bus Turns Turtle

The Madison-Watertown bus tipped over one mile west of Sun Prairie Sunday afternoon at 4 p. m. The driver was alone at the time and received slight injuries in the crash. The car was only slightly damaged and resumed the trip Monday morning. The cause of the accident is not known.

Playground Children Stage Pageant Tuesday

The little playground folk of the city will give a pageant at Brittingham and Tenney parks tomorrow and Wednesday afternoons. The Ginger Bread Boy, Little Red Ridinghood, Uncle Sam, Columbia, and all the rest will be represented in this pageant which includes in its cast something like [illegible] boys and girls. The pageant is under the direction of Mrs. Fanny Steve, director of the Madison playgrounds.

The pageant which is to be given by the youngsters is said to rival in brilliance anything that has ever been given in this city. The little tots have been working all summer under the direction of Mrs. Steve to produce the pageant.

Motor Stage Lines Entering Madison

STOUGHTON—OREGON—MADISON

Leave Stoughton	Sundays	Leave Madison	Sundays
6:30 A.M.		9:00 A. M.	
3:30 P. M.	11:00 A. M.	5:00 P. M.	5:00 P. M.
7:00 P. M.	7:00 P. M.	11:00 P. M.	11:00 P. M.

MT. HOREB—MADISON—VERONA

Bus at Park Hotel

Leave Mt. Horeb	Leave Madison
6:00 A. M.	8:15 A. M.
10:30 A. M	1:00 P. M.
3:45 P. M.	6:15 P. M.
Sundays	
8:30 A. M.	10:30 A. M.
4:00 P. M.	10:00 P. M.

MADISON—PRAIRIE DU SAC

Leave Madison				Leave Prairie du Sac		
A. M.	P. M.			P. M.	A. M.	
9:30	3:30	10:30	Madison	2:40	8:10	9:10
9:55	3:55	10:55	Middleton	2:15	7:45	8:45
10:25	4:25	11:25	Cross Plains	1:45	7:15	8:15
10:45	4:45	11:45	Black Earth	1:25	6:55	7:55
11:00	5:00	12:00	Mazomanie	1:10	6:40	7:40
11:35	5:35	12:35	Sauk City	12:35	6:05	7:05
11:40	5:40	12:40	Prairie du Sac	12:30	6:00	7:00

MILWAUKEE—MADISON

Bus at Park Hotel

	Leave	Arrive
Milwaukee	8:00 P. M	8:15 P. M.
Waukesha	8:45 P. M.	7:35 P. M.
Pewaukee	9:00 P. M.	
Hartland	9:15 P. M.	
Oconomowoc	9:30 P. M.	6:45 P. M.
Sullivan	10:00 P. M.	6:10 P. M.
Rome	10:10 P. M.	6:00 P. M.
Ft. Atkinson	10:45 P. M.	5:30 P. M.
Cambridge	11:10 P. M.	5:05 P. M.
	Arrive	Leave
Madison	12:15 P. M.	4:00 P. M.

STOUGHTON—MACFARLAND—MADISON

Leave Stoughton	Sundays	Leave Madison	Sundays
6:30 A. M.		8:00 P. M.	
10:00 A. M.	8:30 A. M.	12:00 Noon	10:00 A. M.
1:30 P. M.	1:30 P. M.	6:15 P. M.	6:15 P. M.

MADISON-PORTAGE

Bus at Park Hotel

From Madison Read Down			To Madison Read Up	
7:15 A.M.	3:45 P.M.	Madison	12:45 P.M.	8:45 P.M.
7:45 A.M.	4:15 P.M.	Token Crk.	12:00 M.	8:00 P.M.
8:00 A.M.	4:30 P.M.	Windsor	11:45 A.M.	7:45 P.M.
8:15 A.M.	4:45 P.M.	De Forest	11:30 A.M.	7:30 P.M.
8:35 A.M.	5:00 P. M.	N. Leeds	11:15 A.M.	7:15 P.M.
9:00 A.M.	5:30 P.M.	Poynette	11:00 A.M.	7:00 P.M.
9:45 A.M.	6:00 P.M.	Portage	10:15 A.M.	6:30 P.M.

Sunday—

Lv. Madison 7:15 A. M.—Leave Portage 6:30 P. M.

MADISON-FOND DU LAC

Bus at Park Hotel

South Bound—Read Up..				North Bound—Read Down		
A.M.	P.M.	P.M.		A.M.	P.M.	P.M.
12:00	3:00	8:30	Madison	8:00	1:30	4:30
11:25	2:25	7:55	Sun Prairie	8:35	2:05	5:05
10:30	1:30	7:00	Columbus	9:30	3:00	6:00
9:50	12:50	6:20	Beaver Dam	10:20	3:40	6:40
9:00	12:00	5:30	Waupun	11:00	4:30	7:30
8:20	11:20	4:50	Lamartine	11:40	5:10	8:10
8:00	11:00	4:30	Fond du Lac	12:00	5:30	8:30

MIDDLETON—MADISON

From Middleton	Sundays	From Madison	Sundays
7:30 A. M.		8:30 A. M.	
10:30 A. M.	9:00 P. M	11:15 A. M.	9:45 A. M.
1:00 P. M.	5:00 P. M.	1:45 P. M.	5:45 P. M.
	Sat. Special		Sat. Special
4:00 P. M.	11:45 A. M.	5:00 P. M.	12:20 P. M.

Advertise your Real Estate Wednesday. Send copy in early

NEXT WEDNESDAY WILL BE REAL ESTATE DAY
WATCH FOR CLASSIFIED REAL ESTATE ADS

Advertise your Real Estate Wednesday. Send copy in early.

RATES FOR CLASSIFIED ADVERTISING

Transit or out-of-town ads are 9c per agate line. Figure six words to a line. Cash in full payment must accompany the order for above named ads.

Local ads are 1c per word. 6 insertions for the price of five.

Minimum charge is 25c.

Count every initial or group of figures as one word.

Figure four (4) words for a blind address.

CLOSING HOURS

All want ads must be in The Capital Times office by noon the day of publication. Ads taken later than noon will be inserted the following day.

Orders over the telephone with the exception of household goods for sale, and situations wanted are accepted from parties whose names are listed in the telephone directory.

All ads must be given for a definite number of insertions.

If replies to ads have to be mailed, add 10c for postage.

When there is an error in your ad notify us at once. The Capital Times is always glad to correct an error which is made by any of its employes, but will not be responsible after the first insertion.

Ads accepted up to 12 o'clock noon for publication in the same day's issue. Leave ads at the following Pharmacies:

Kleinheinz Pharmacy,
714 Park St.
Badger Pharmacy,
1320 University Ave.
Badger Pharmacy,
210 State St.
Tiedemann's Pharmacy,
702 University Ave.
The Lackey Pharmacy,
620 W. Washington Ave.
Fair Oaks Pharmacy,
1118 Atwood Ave.

SOCIETIES AND LODGES 78

Madison Chapter No. 4 R. A. M. Stated Convocation 2nd and 4th Mondays of each month.

All bodies meet at the Masonic Temple [illegible] Wisconsin Ave.

BEAVERS

A Wisconsin Fraternal Society on a Legal Reserve Basis. Insurance for members from age 2 to 60.

Madison Colony, No. 460—Meetings 1st

MOOSE

Madison Lodge, No. 1451, Loyal Order of Moose—7 and 9 East Main street. Meetings every Monday night. Pay dues to H. S. Bostock, Secretary.

KNIGHTS OF PYTHIAS

Meetings held every Tuesday evening 7:30 p. m. Beaver Building.

UNITED COMMERCIAL TRAVELERS

Capital City Council, No. 126. Regular meeting first Saturday, 7:30 p. m., Moose Hall. J. Keihber, Sec'y, Phone Badger 2578.

[illegible] Wednesday of each month at [illegible] W. Main St.

ODD FELLOWS

Independent Order of Odd Fellows, Hope Lodge, No. 17—Meets every Friday evening at 7:30 at Odd Fellows' Hall, 308 West Mifflin street, Harry Harman, Sec'y.

LOST AND FOUND 1

LOST—Savings account bank book. Traverse City, Michigan. Call B. [illegible]

LOST—[illegible] boards of truck. Return [illegible] Transfer, 450 W. Mifflin [illegible] Reward.

[illegible] pen. $25 re-[illegible] in good condition. [illegible] Call B. 4572.

[illegible] fabric tire, rim and cover between Monroe and Madison on [illegible] 41 and 42. Reward. [illegible]

[illegible] with leather [illegible] women's apparel. [illegible] of Madison on No. [illegible] Please call F. 2169 and [illegible] reward.

LOST—[illegible] police dog. If found call [illegible]. Liberal reward.

PERSONALS

The Wisconsin Advertising Company is moved from the Pioneer Block to [illegible]-708 Beaver Insurance Bldg.

MALE HELP WANTED 4

BRICK LAYERS wanted by Warden Allen Co. $1.25 per hour. Steady work. Long job. Phone B. 3273 between 12 and 1 o'clock week days.

WANTED

Boy to learn Printing trade. Inquire foreman Capital Times Co.

Demented Man Burns Barn; Fires At Owner

LA CROSSE, Wis.—Last night the barn on the farm of William Weimar, near [illegible], was mysteriously burned. Firemen who turned out to help fight the fire were fired upon, they claim, by a man with a rifle who hid in the corn field. The barn was destroyed and several head of cattle were burned. This morning Mr. Weimar met a man, who appeared demented, and was armed with a rifle. Weimar was ordered to return to his home. He summoned the sheriff and a posse was formed to search for the man.

Wulf Taken To Iowa On White Slave Charge

[illegible] of Davenport, Iowa, of Ar-[illegible] Wulf, arrested at Tomah on a white slave charge, was ordered by Federal Judge Claude Z. Luse in the U. S. District court here Saturday afternoon. He is charged with having transported Ida Munns, 17, from Iowa to Wisconsin. It is understood by the [illegible] that they wish to marry each other but the girl's parents object.

Chellis And Touton Serve 200 Strike Orders

W. [illegible] Chellis, U. S. marshal, and William Touton, deputy marshal, left the city Saturday evening for Superior where they will serve over 200 copies of [illegible] orders on striking railway workers.

STEAL 30 AUTOS

CHICAGO—[illegible] Carroll, Centralia, Ill., [illegible] and two men were held for stealing [illegible] automobiles and violating the Mann act.

REEDSBURG—Mrs. Albertine Meske, 80 years old, an old resident here, died of heart failure.

MALE HELP WANTED 4

FOUR MEN to take orders on regular routes, $12.00 per week and expenses, commission. Call at 529 State St., after 6 p. m.

MAKE $20 weekly mailing circulars; complete instructions, 25c. Varga Supply Co., 608 E. Sixteenth St., New York City.

MEN—We have openings for a few intelligent men in our sales organization. If you have a desire for selling here is an exceptional chance to connect with the company having real products. Special sales training is given and future assured. See Mr. Anderson, Capital Hotel, 4 to 6 or 7 to 9 Monday p. m.

LARGE CHICAGO CORPORATION will employ 2 neat appearing young men to travel. Experience not necessary. Must be reliable and have the work habit. Position is permanent, pleasant and pays well. Good future. Apply Tuesday 9 to 4. Frances Hotel, 123 King St. Mr. Groom.

MAN wanted to work in meat market. Must be first class shop tender. Apply or write Hopfensperger Bros., Appleton, Wis.

MAN wanted to work in sausage factory. Write or apply at once to Hopfensperger Bros., Appleton, Wis.

FEMALE HELP WANTED 5

WAITRESSES WANTED—Apply 5 E. Wilson street, Madison Club.

MAID for general housework. Mrs. W. B. Noe, 1112 Grant St. B. 3292.

GIRL for general housework. Mrs. W. R. Curkeet, 1240 Sherman Ave. BR. 5038.

GIRL for plain cooking and help with rest of work. Phone B. 5525.

Male and Female Help Wanted 6

AN INTELLIGENT PERSON, either sex, may earn $100 to $200 monthly corresponding for newspapers; $15 to $25 weekly in spare time, experience unnecessary; no canvassing; subjects suggested. Send for particulars. National Press Bureau, Buffalo, N. Y.

SITUATIONS WANTED—MALE 8

Young Man

wishes work on farm. 3 years' experience. Have some knowledge of tobacco work. Reference if required.

B. B., Care Capital Times

BOARD AND LODGING 11

BOARDERS wanted. 518 E. Wilson St. F. 114.

ROOMS TO RENT 10

FURNISHED ROOM convenient to square. Gentlemen preferred. B. 6465.

NICE SUITABLE ROOM for working man. 418 W. Gorham.

3 FURNISHED ROOMS for light housekeeping. 207 Marion St. Phone B. 2718.

NICELY FURNISHED ROOM in factory district. 457 Jean. B. 39.

FURNISHED ROOM for rent for one or two. 215 So. Bassett. B. 3613.

FURNISHED ROOMS. B. 3387.

FURNISHED ROOM. 322 State.

FURNISHED ROOM

Nicely furnished room off bath, private entrance, one block from square. Phone

Badger 4300

Housekeeping Rooms to Rent 13

TWO FURNISHED ROOMS for light housekeeping. 2206 Jackson St.

TWO FURNISHED ROOMS for light housekeeping. Modern except heat. 305 S. Dickinson St.

FLATS TO RENT 14

MODERN FOUR ROOM FLAT, also two large rooms cheap. Large store, tailor shop now. West Washington, Badger 1693.

MODERN four room flat for rent, corner East Dayton and Thornton ave., $55. B. 4050.

MODERN second flat for rent by the first of Sept. 201 N. Frances.

NEAT FIVE ROOM flat, modern except heat. Third floor at 3 North Blair. Phone Badger 6844.

6 ROOM UPPER FLAT for rent. $35.00 933 Jenifer. Possession Sept. 1.

FINE HEATED apartment in good residential district. six rooms including three bedrooms, also a sleeping porch. Rent $80.00 per month. B. 5335.

COTTAGES TO RENT 18

FURNISHED COTTAGE for sale or rent. On Lake Mendota. B. 7730.

Offices and Studios to Rent 20

OFFICE FOR RENT on square. Completely equipped, including typewriter. Inquire room 5, Nine W. Main.

WANTED TO RENT—HOUSES 26

BY SEPT. 1st—6 to 8 room house or flat with garage. No children. B. 3826.

Miscellaneous For Sale 38

Clearing Sale of Summer Millinery

We are disposing of all summer hats at a big sacrifice. White ribbon hats, Canton crepe, Baronette, satin and taffeta, felt hats, vacation style. Sand, beaver, red, jade, copenhagen, perry winkle, purple, black, brown, navy, 230 State

Good assortment of velours

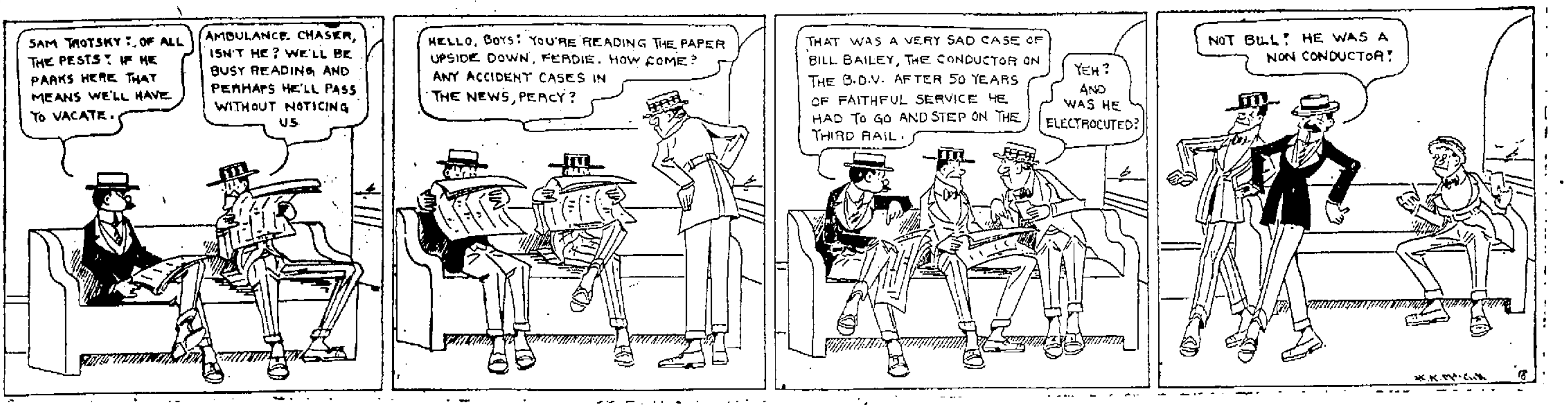
MRS. LEE SCANLAN

WEARING APPAREL for sale at reasonable prices. New organdie dress, broadcloth fur trimmed coat, suit, spring coat, brown satin and lace evening dress, taffeta dress, waists, all sizes 36 to 40. 606 Univ. Ave., F. 95.

BICYCLE cheap. Call Badger 2662.

PERCY AND FERDIE—Yes, Bill Was Immune.

By H. A. MacGILL
Creator of the Ball-Room Boys.


SAM TROTSKY! OF ALL THE PESTS! IF HE PARKS HERE THAT MEANS WE'LL HAVE TO VACATE.
AMBULANCE CHASER, ISN'T HE? WE'LL BE BUSY READING AND PERHAPS HE'LL PASS WITHOUT NOTICING US.
HELLO, BOYS! YOU'RE READING THE PAPER UPSIDE DOWN, FERDIE. HOW COME? ANY ACCIDENT CASES IN THE NEWS, PERCY?
THAT WAS A VERY SAD CASE OF BILL BAILEY, THE CONDUCTOR ON THE B.D.V. AFTER 50 YEARS OF FAITHFUL SERVICE HE HAD TO GO AND STEP ON THE THIRD RAIL.
YEH? AND WAS HE ELECTROCUTED?
NOT BILL! HE WAS A NON CONDUCTOR!

MISCELLANEOUS FOR SALE

FOR SALE

We buy and sell second hand motorcycles, motor wheels and bicycles special. Bargains now. See them at once, at 107 N. Hamilton street, Madison, Wis.

Order Your Wood Now for Next Winter

I have about 150 cords of dry oak wood on my farm near Cottage Grove. Split wood, block wood or cord wood, $10.00 per cord on farm or $15 per cord delivered to your cellar. Place your order early. Phone—

Clyde A. Gallagher
Owner
Badger 5408-4539

MISCELLANEOUS WANTED 37

CANOE WANTED—State price, address and phone number. Write to L. R. L. Care Capital Times.

HOUSEHOLD GOODS 33

MAJESTIC six hole range for sale. Coal or wood, large reservoir, only been used 1 year. Bargain at $50.00. Call B. 3203.

FURNITURE, bedroom complete. B. 7642, 431 Hawthorne.

HOUSEHOLD GOODS including radiant fire gas grate, leather rocker, bed and springs, stands. Tuesday, Aug. 15, 3-6 p. m. at 1617 Regent St.

ANTIQUE black walnut dining chairs, bed room suite, tables, writing desk, couch, sewing machine, kitchen cabinet, etc., leaving city. 810 N. Lake, second floor. F. 1559.

GAS STOVE and sewing machine for sale. Call B. 5075.

STUDENT FURNITURE for sale including rugs and beds. 302 Huntington Ct.

FARM PRODUCTS 47

Spring Pigs

6 to 12 weeks old. Phone
F. W. RIEDER
B. 1663 or B. 166

CHESTER WHITE Spring Boars. Order now and get good ones before they are picked over. Also have two yearlings. Geo. A. Stamm, Alma Center, Wis.

Pure Bred Bull Dogs

7 months old, one male and one female, screw-tail, both pure white. House and auto broke. $25.00 each.

G. Thomas
Box 77, Edgerton, Wis.

BUSINESS CHANCES 51

MOVING PICTURE SHOW for sale including building in city of five thousand, doing good business. Price $12,000. Reasonable terms. Write E-51 Capital Times.

PROFESSIONAL SERVICES 52

H. J. STEVE
Chiropractor
Office over Gamm Jewelry Store
9 W. Main St.
Hours 10-12—2-5 p. m.
Mon., Wed., Fri. Evenings 7-8
Phone Badger 3690

Office Phone Fairchild 1409
Residence Badger 4562
GEO. HELLAND
Chiropractor
Office Over M. C. Shoe Store
7 W. Main

BUSINESS SERVICES 53

Union Transfer
STORAGE MOVING SHIPPING
155 E. WILSON ST.
PHONE B. 1254

Do You Know?

Do you know that people get more enjoyment and knowledge from reading than from any other form of recreation? Are your eyes strong enough to make reading a pleasure? If not see

FEGLEY OPTICAL CO.
125 King St.

Stimpson Computing Scales

BARGAINS in Big Line of New and Used Scales in all makes. Also Electric Coffee Mills, Meat Choppers, Slicers, etc. See Thorson th Scale Man and save money.

F. J. THORSON
222 E. Main B. 1383-3925
State Agent

How To Improve Your Want Ads

Slight changes often bring better results.

In each of these ads the words "Wanted to Rent" are not the index words. In ad 1, "House, 10-12 rooms" should appear at the beginning. In ad 2, "House or Flat" should appear first.

WANTED TO RENT—10-12 room house for fraternity purposes. Call F. .... between 12 to 2.

WANTED TO RENT by Sept. 1, 6 to 8 room house or flat. No children. B.....

In this ad "For Sale" is not the index word. Ad should read "Ford Sedan for sale, etc." This little change would improve this ad wonderfully. Balance of copy is very good as advertiser has thoroughly described the car.

FOR SALE—Ford sedan, model 1918, mileage 15,000, just overhauled, new Ensign Carboretor, detachable rims, shock absorbers, extra rims, two new cord tires, two new oversize fabric tires, 3 fair spares, car just painted. Reason for selling, leaving city. Price $385 cash or $450 on time, $275 down. Phone Badger ...., ... N. Mills.

"For Sale" in this ad appears in wrong position. Ad should read "Table with four chairs for sale, etc.".

FOR SALE—Table with four chairs and leather couch in good condition. Call B. ...., at .... Center Ave.

In ad 5 "For Rent" is not index word. "Furnished Flat" should appear at beginning of ad.

FOR RENT—For summer, reasonably, furnished lower flat. Upper suite light housekeeping double or single room. Children welcome. B. ....

In ad 6 the index words are not "For Sale," but "Lake Shore Property." Copy in this ad is very good.

FOR SALE—Lakeshore property, high and sightly, year around, lake shore home, 5 rooms, furnished or unfurnished; walking distance, 2 blocks from car line, 12 minutes ride to university, cement walk, shade, fruit, electricity, good bathing and fishing. Cut price for quick sale. Owner F. ....

Begin your ads correctly and tell a complete story. Then you surely will get better results. Phone your want ads to The Capital Times, B. 2200.

BUSINESS PERSONALS 56

H. F. SHARRATT
Fireproof Storage

Local and Long Distance moving, furniture packing and shipping.
Office 309 E. Wilson. Phone B. 1974

MADISON FIREPROOF WAREHOUSE
H. C. RINDY, OWNER & MGR.
Long Distance Moving
A SPECIALTY
Phone Badger 742 or Badger 6237

G. Schmelzer

Digging cellars, grading, sodding lawns, etc.

1513 Madison St.

Joe's Store
Near C. & N. W. Depot
Parcels Checked, 5c

Violins from $15.00 to $125.00.

Diamond Rings from $50.00 to $150. These are bargains.

Watches, Chains and Rings sold at a 20 per cent discount this month.

New Suits made to your measure. Blue and Gray Serge and Worsteds. $25.00, $30.00, $35.00, $40.00.

I can match your coat and vest with a pair of pants.

Your old Suit cleaned so it looks like new. Ship by parcel post.

F. A. HALLMAN

The Auto Spring Man

Springs for all makes of cars, wholesale and retail. We put them on your cars.

Phone B. 3648-213 E. Main

Fix Up Your Lawn & Buy Your Seed at
ANDREW MAYERS
108 King Street

FITCH
EST 1849
Funeral Directors
73rd Year
Tel. B. 3720

BUSINESS SERVICES 53

Have your car repaired at the Fourth street auto repair shop.

Special prices

for installing transmission bands for Fords, without starter $2.85 with starter $3.60 including all materials. All other work 75c per hr.

H. C. Steinhauer
B. 4024

The Madison Rug Factory

Repairs, shampooes, resizes, all kinds or rugs.

Call B. 1356
124 W. Mifflin Street

Wm. Steive Co.
219 E. Washington Ave.

Expert Painting and Trimming. Prompt and efficient service guaranteed.

B. 5589

MUSICAL INSTRUMENTS 59

KIMBALL PIANO for sale, in good condition. Call B. 5197

KING SLIDE TROMBONE for sale. This horn is in excellent condition in every respect. The plating is silver, with gold bell. B flat tenor. Low pitch. Good side opening, leather case. Music lyer, gold plated Pryor mouth piece. As good as new. Write E-52, Capital Times.

JOE MAES
218 STATE ST. MADISON, WIS.
Phone Badger 7976
Holton Saxophones and
Band Instruments
High-grade Musicians Supplies
Tested Reed-Accessories
Drums and Traps

AUTOMOBILES FOR SALE

1920 Model Ford Coupe

for sale with starter. All new tires, bumper in front and rear. Speedometer and many other extras.

1920 Ford Roadster

with starter and new tires. Both of these cars are in good mechanical condition.

B. 4020

FORD Speedstar body. Phone Badger 7718.

AUTOMOBILES FOR SALE 64

Columbia Silent Knight

If you would like to own a high grade car call at 123 N. Henry. This car is in excellent condition and can be bought at a surprisingly low price.

FOR SALE

Overland touring car in A-1 condition. A good, all around car that will give lots of good service. Can be bought for $100 if taken immediately.

Extraordinary Buy

Hudson Super Six Sedan. Looks like new and runs like new. Just been overhauled. Good paint and tires. In A-1 condition in every respect. Price will satisfy you.

123 N. Henry

HOUSES FOR SALE 70

HOMES

300 feet on University Ave. 4½ acres good house, fruit and shade trees, high and level, very reasonable.

Who has a small safe to trade for one 28x24, 38 in. high.

MICH. DIEDERICH
223 S. Mills St. Phone B. 69

For Sale or Rent

A beautiful eight room house on Spaight Street. All modern. Possession at once.

Everett Kissam
Room 307 Beaver Building
Badger 204—B. 1467

SEVEN ROOM house, garage, workshop, three lots, fruit trees. Box 205 Mazomanie, Wis., A. M. Bohn.

6 ROOM HOUSE for sale on East side. Reasonable. Write S. 9, Capital Times.

MODERN six room house may be bought on monthly payments. Address A. B., Capital Times.

FOR SALE—6 room house on Clymer Place. Near university. Not modern. Price $3,200.00. Easy terms. J. A. Swenson, 7 W. Main St. B. 604 or B. 2449.

SEVEN ROOM HOUSE—One block to park, school and one-half block from street car. Driveway and room for garage. Price $4,000. $1,500 down. Phone Badger 3387.

FOR SALE—New bungalow. Never has been occupied. Near East Side high school. Price $4,500. $1,000 down. Balance on easy monthly payments. J. A. Swenson, 7 W. Main St. B. 604 or B. 2449.

FOR SALE—6 room house on North Baldwin St. Modern. Large shady lot. Price $6,500.00. Easy terms. J. A. Swenson, 7 W. Main St. B. 604 or B. 2449.

FOR SALE OR EXCHANGE 73

For Sale or Exchange

Confectionery and Variety Store at wholesale price.
Store for rent reasonable.
Clyde A. Gallagher, Owner
Phone Badger 5408 or 4539

FOR SALE OR RENT

GARAGE with dwelling for sale or rent near Madison. Write E 52, Capital Times.

FARM LANDS

IMPROVED FARMS near Madison. 9, 13, 40, 60, 65, 70, 80, 90, 120, 160, 180, 280. Also new modern 7 room house on west side, $5200. See M. H. Atwood, over American Exchange Bank, Madison, Wis.

180 ACRE FARM for sale or rent near Marxville. Call 516 West Doty St. Phone F. 1552.

REAL ESTATE WANTED 72

WANTED TO BUY from owner for cash a lot for residence—west side within two blocks from car line. Phone Badger 3710.

LEGAL NOTICES

First insertion Aug. 7, 1922; last Aug. 21

NOTICE TO PROVE WILL AND NOTICE TO CREDITORS

STATE OF WISCONSIN, COUNTY COURT—IN PROBATE.

In re Estate of ARNE A. STEENSRUD, Deceased.

Notice Is Hereby Given, That at the Regular Term of said court to be held on the first Tuesday of September, A. D. 1922, at the Court House in the city of Madison, county of Dane and state of Wisconsin, there will be heard and considered the application of Mattie Steensrud to admit to probate the last Will and Testament of Arne A. Steensrud, late of the village of Black Earth in said county, deceased, and for the appointment of an executor, (or, administrator with Will annexed);

Notice Is Hereby Further Given, That at the Regular Term of said court to be held at said Court House, on the first Tuesday of January, A. D. 1922, there will be heard, considered and adjusted, all claims against said Arne A. Steensrud, deceased;

And Notice Is Hereby Further Given, That all such claims for examination and allowance must be presented to said county court at the Court House, in the city of Madison, in said county and state, on or before the 5th day of December, A. D. 1922, or be barred.

Dated Aug. 5, 1922.
By the Court,
A. G. ZIMMERMAN,
Judge.
Michelson & Proctor,
Attorneys.
Aug. 7 doaw 3 wks. Mon.

REPORT OF CITY PROPERTY COMMITTEE

First insertion Aug. 7, 1922; last Aug. 21

Notice to Creditors.

STATE OF WISCONSIN, COUNTY COURT, DANE COUNTY—In Probate

Notice is Hereby Given, That at the Regular Term of the County Court, to be held in and for said county, at the Court House in the city of Madison, in said county, on the first Tuesday of December, A. D., 1922, the following matters will be heard, considered, examined and adjusted:

In Re Estate of Gertrude C. Wald, deceased.

All claims against Gertrude C. Wald, late of the city of Madison, in said county, deceased.

All such claims for examination and allowance must be presented to said court, at the Court House, in the city of Madison, in said county, on or before the 7th day of December, A. D., 1922, or be barred.

Dated August 5, 1922.
F. K. SHUTTLEWORTH,
Attorney.
By the Court,
A. G. ZIMMERMAN,
Judge.
Aug. 7 doaw 3 wks. Mon.

LEGAL NOTICES 77

First insertion Aug. 14, 1922, last Aug. 28

NOTICE FOR FINAL SETTLEMENT (AND INHERITANCE TAX ADJUSTMENT)

State of Wisconsin, County Court, Dane County—in Probate

In Re Estate of ELLEN RASHFORD, Deceased.

Notice Is Hereby Given, That at the Regular Term of the County Court, to be held in and for said county, at the Court House in the city of Madison, in said County, on the first Tuesday of September, A. D., 1922, there will be heard, considered, examined and adjusted:

The application of Henry N. Rentz, the administrator of the estate of Ellen Rashford, late of the Town of Montrose, in said county, deceased, for the settlement of his final account as such executor (or, administrator), which account is now on file in said court, for the determination of the inheritance tax, and for the assignment of the residue of said estate to those entitled thereto.

Dated August 12, 1922.
Kroncke & Sauthoff, Attorneys.
By the Court,
A. G. ZIMMERMAN,
Judge.
Aug. 14 doaw 3 wks. Mon.

PROPOSAL FOR UNIVERSITY WORK

Sealed bids for the entire construction except heating, wiring and painting for the locker and shower rooms under East Bleachers, Camp Randall Stadium at the University of Wisconsin, Madison, Wisconsin, will be received up to 3 p. m., Wednesday, August 23, 1922.

Bids must be made out on the printed forms furnished by the University and must be accompanied by a certified check or bid bond for 10 per cent, of the bid, drawn to Mr. M. E. McCaffrey, Secretary.

Plans may be obtained for estimating at the office of the Business Manager of the University, Administration Building, Madison, on deposit of $5.00.

Address your bid to the Board of Regents of the University of Wisconsin (Mr. M. E. McCaffrey, Secretary) and mark on the envelope "Proposal for locker and Shower Rooms, Camp Randall."

No bids will be received after 3 p. m. August 23, 1922.

The Regents of the University of Wisconsin reserve the right to reject any and all bids.

The Capital Times Aug. 14, 1922.

LEGAL NOTICES LEGAL NOTICES

First Insertion July 31, 1922; last Aug. 21.

NOTICE OF SEPTEMBER PRIMARY

County Clerk's Office

STATE OF WISCONSIN,)ss.
County of Dane.

NOTICE IS HEREBY GIVEN that at a primary to be held in the several towns, wards, villages and election districts of the state of Wisconsin on the first Tuesday of September, A. D. 1922, being the fifth day of said month, the following officers are to be nominated:

A GOVERNOR, in place of John J. Blaine, whose term of office will expire on the first Monday of January, A. D. 1923.

A LIEUTENANT GOVERNOR, in place of George F. Comings, whose term of office will expire on the first Monday of January, 1923.

A SECRETARY OF STATE, in place of Elmer S. Hall, whose term of office will expire on the first Monday of January, 1923.

A STATE TREASURER, in place of Henry Johnson, whose term of office will expire on the first Monday of January, 1923.

AN ATTORNEY GENERAL, in place of William J. Morgan, whose term of office will expire on the first Monday of January, 1923.

A UNITED STATES SENATOR, in place of Robert M. La Follette, whose term of office will expire March 4, 1923.

A REPRESENTATIVE IN CONGRESS for the Third Congressional District, comprised of the counties of Crawford, Richland, Grant, Iowa, Dane, La Fayette and Green.

A MEMBER OF ASSEMBLY for the First Assembly District of Dane County, comprised of the city of Madison and the town of Madison.

A MEMBER OF ASSEMBLY for the Second Assembly District of Dane County, comprised of the towns of Albion, Blooming Grove, Bristol, Burke, Christiana, Cottage Grove, Deerfield, Dunkirk, Dunn, Medina, Pleasant Springs, Sun Prairie, Windsor and York; the villages of Cambridge, Deerfield, De Forest, McFarland, Marshall, Rockdale and Sun Prairie and the city of Stoughton.

A MEMBER OF ASSEMBBLY for the Third Assembly District of Dane County, comprised of the towns of Black Earth, Berry, Blue Monds, Cross Plains, Dane, Fitchburg, Mazomanie, Middleton, Montrose, Oregon, Perry, Primrose, Roxbury, Rutland, Springdale, Springfield, Vermont, Verona, Vienna and Westport; and the villages of Belleville, Black Earth, Blue Mounds, Brooklyn, Cross Plains, Dane, Mazomanie, Middleton, Mt. Horeb, Oregon, Verona and Waunakee.

A COUNTY CLERK, in place of George J. Fjelstad, whose term of office will expire on the first Monday of January, 1923.

A COUNTY TREASURER, in place of Herbert G. Rinder, whose term of office will expire on the first Monday of January, 1923.

A SHERIFF, in place of W. H. McCormick, whose term of office will expire on the first Monday of January, 1923.

A CORONER, in place of W. E. Campbell, whose term of office will expire on the first Monday of January, 1923.

A CLERK OF CIRCUIT COURT, in place of Herbert F. Hansen, whose term of office will expire on the first Monday of January, 1923.

A DISTRICT ATTORNEY, in place of T. G. Lewis, whose term of office will expire on the first Monday of January, 1923.

A REGISTER OF DEEDS, in place of C. A. Lewis, whose term of office will expire on the first Monday of January, 1923.

A SURVEYOR, in place of Phillip Hintze, whose term of office will expire on the first Monday of January, 1923.

A PRECINCT COMMITTEEMAN from each election precinct for each political party.

Said election shall be held and conducted, the votes canvassed and returns made in accordance with law.

Given under my hand and the official seal of the Board of Supervisors at the courthouse in the city of Madison, this 8th day of July, A. D. 1922.

GEORGE J. FJELSTAD,
County Clerk, Dane County.

July 31 doaw 4 wks. Mon.

THE CAPITAL TIMES
An Independent Newspaper
Official Paper of the State of Wisconsin

Entered as second class matter at the Postoffice at Madison, Wis., under the Act of March 3, 1879.

Published every afternoon except Sunday by The Capital Times Company, Capital Times Bldg.

Member of the Associated Press
The Associated Press is exclusively entitled to the use for republication of all news dispatches credited to it or not otherwise credited in this paper and also the local news published herein. All rights of republication of special dispatches also are reserved.

Member of Audit Bureau of Circulation

William T. Evjue ....Editor
Tom C. Bowden ....Business Manager

TERMS OF SUBSCRIPTION
By Carrier In Madison
One year in advance, $6; six months in advance, $3; per month, 50 cents; per week, 12 cents.
By Mail, Prepaid
One year, $4; six months, $2; three months, $1.25.

MONDAY, AUGUST 14, 1922

We Have Respect for Honest Stalwarts

THE Capital Times has respect for an honest stalwart. If a man is honest in his views and makes no attempt at pretense or sham, he is entitled to his view and should be respected for his honest convictions.

We have more respect for E. L. Philipp than we have for the political hypocrites who are now attempting to disguise themselves as progressives in order to fool some people. Philipp never indulged in that sort of practice. He was a stalwart and he did not attempt to get votes by claiming to be anything else. A man who will make one claim BEFORE election and do the opposite AFTER election is politically dishonest.

Two years ago, H. W. Stokes was elected to the assembly by the progressives of Jefferson county. Our whole theory of representative government rests on the basic fact that we send men to the halls of legislation to represent the majority of the people of the different districts. When a man goes back on the people who sent him there, he repudiates his trust. Mr. Stokes did that. When Stokes arrived at the state capitol, he was immediately surrounded by influences antagonistic to the wishes of the people who had sent Mr Stokes to the assembly.

Mr. Stokes surrendered and he had a thoroughly reactionary record in the 1921 session. Elected as a progressive, he proceeded to vote for privilege on nearly every roll call.

The people of Jefferson county ought to let Mr. Stokes know on primary day that he cannot trifle with them in such a manner. The progressives of Jefferson county ought to elect Mr. Stokes to stay at home during the coming two years.

Eugene H. Killian, the progressive opponent of Mr. Stokes, was a member of the 1921 session. He was always found voting on the side of the people. If the common people in Jefferson county want representation in the next assembly, they ought to elect Mr. Killian by an overwhelming majority.

What Alibi Now?

WHEN Senator La Follette was filling halls to over-flowing in the lake shore counties, The Milwaukee Journal sought to discount that fact by maintaining that the lake shore counties are inhabited largely by people of German descent.

We wonder what alibi The Journal will now have for the reception that was accorded Senator La Follette during the past week in the old stalwart first district. The crowds at Racine, Waukesha, Janesville and Beloit were a repetition those in the lake shore counties.

The Milwaukee Journal is very careful not to tell its readers much about the senator's crowds. It is also careful not to tell its readers that the senator discussed the war in the stalwart first district in the same manner as he did in the lake shore counties. And, quite naturally, it refuses to tell its readers that the senator's discussion of the war has been greeted with enthusiasm in the first district.

So thoroughly reactionary has The Milwaukee Journal become that it has now maneuvered itself into the same position The Milwaukee Sentinel was in twenty years ago.

Pitching Horse Shoes

THE Illinois Agricultural Association (Illinois Farm Bureau) has worked itself up to a high pitch of excitement over horseshoe pitching. Over a fourth of its Weekly News Letter of July 27, 1922, is devoted to the 19 Official Horseshoe Pitching Rules. Meanwhile Mr. J. R. Howard, president of the American Farm Bureau Federation, of which the Illinois Agricultural Association is a conspicuous part, is devoting his energies in advocacy of the Ship Subsidy Bill. Even friendly critics of the Farm Bureau movement are pointing out that Mr. Howard has misrepresented his own organization in regard to Ship Subsidy matters. It is reasonable to suppose that they would not be unwilling to forego the pleasure of receiving information on horseshoe pitching provided they could get some definite and reliable data on Ship Subsidy and kindred matters.

Nero fiddled while Rome burned; the Illinois Farm Bureau pitches horseshoe while Ship Subsidists try to raid the public treasury.

Voice of the People

EAST SIDER PROTESTS.

[To the Editor]—What are taxes paid for? To keep up the city, sprinkle the streets and keep up the city in general, I suppose.

Just a little incident of how that is being done:

Last week when we had rain the sprinkler was on Fair Oaks and Atwood avenues two or three times a day and even at ten o'clock at night. This week, with no rain, and about fifty loads of dirt passing on Fair Oaks avenue every day leaving its trail of dirt and dust we have no sprinkling.

Please tell me what is the matter with our Street Department.—A Citizen.

ACCIDENT HALTS CANDIDACY.

[To the Editor]—On account of being injured in an auto accident I was not able to see about filing my nomination papers for Sheriff. I wish to thank all my friends who circulated my nomination papers and other assistance.—C. K. Herried, Stoughton, Wis.

IS HE LA FOLLETTE SUPPORTER?

A communication received by the Capital Times from Baraboo states that C. M. Du Bois, running on the county ticket in Sauk county, claims to be a La Follette man. According to the communication, Mr. Du Bois signed the following letter which was sent out on March 11, 1918:

Baraboo, Wis., March 11, 1918.

My Dear Sir:

We have a campaign on which is not a political campaign, but is a clean cut fight between loyalty and disloyalty, just as clean cut as the fight over in France.

This fight comes on in the Republican primaries on March 19th, which is next Tuesday. We need every vote we can get, and every American should be ready to go into the Republican primaries on next Tuesday and vote for Lenroot and Loyalty. Every vote cast for anybody except Lenroot helps Thompson and disloyalty.

The world is watching this fight as it is the first important election since the war was started and we must win and we are depending on you as a loyal American to do your part to put Wisconsin right before the people of the United States and thus uphold the President.

Yours truly,
(Signed) C. M. Du Bois,
Chairman.
(Signed) A. P. Cheek,
Secretary.

[To the Editor]—I want to congratulate you on having been able to make arrangements for the daily publication in your paper of Mr. Edgar Guest's poems. I have been a daily reader of his poems for years and they will be far more beneficial to our people from day to day than any political items that you may publish.—Henry Johnson, State Treasurer.

REPLIES TO GANFIELD.

[To the Editor]—Mr. Walter D. Corrigan is too charitable with Dr. W. A. Ganfield.

We expect that the man who is the head of a respectable institution of learning and who is a candidate for the high office of United States senator would possess common honesty at least.

Dr. Ganfield in his speeches as reported in the Milwaukee Sentinel stoops lower than any common ward-heeler. For instance when he said:

"La Follette is all through in the senate, He can't get things done for Wisconsin as his record from 1916 discloses. Since then down to date Bob's course, as presented in the most favorable light by his boosters, is barren of results."

Any ordinary intelligent person whether he believes in the principle advocated by Senator La Follette or not knows that he is one of the most influential men in the senate. When Dr. Ganfield is a non-entity in the U. S. senate, he Ganfield conveys the idea that Senator La Follette is a non-entity in the U. S. senate, he propounds a falsehood.

When Dr. Ganfield implies in his speeches that Senator La Follette is not a patriotic American, he becomes a common falsifier.

When Dr. Ganfield says that Senator La Follette is a half socialist and half republican, he stoops to the arguement of a common ignorant ward-heeler.

It is no crime to differ in principle with Senator La Follette, but when a man with the supposed intelligence and standing of Dr. W. A. Ganfield goes about the state traducing his opponent, it becomes a stench in the nostrils of honest men.

Ignorance of politics and the methods of politicians is no excuse for Dr. Ganfield. What he talks about when referring to Senator La Follette are matters of common honesty. Dr. Ganfield does not discuss the principles advocated by Senator La Follette. He deals in generalities and propounds things that are not true.—A Reader.

A WOMAN'S LETTER.

[To the Editor]—Being greatly interested in the political situation in this state, I would like to see more discussions in your civics column, as it is "by argument we learn." Being new to country life also, naturally everything interests me, and the first thing I noticed was the comparatively few women voting, the men voting four to one woman in township elections. If we are to keep our state from corporate rule it behooves the country women to turn out in full strength to register their vote. In the towns and cities whole families vote, especially the friends of corporations, while one or two will vote in a family living in the country. I suppose some one must stay on the farm, but everyone of voting age should make a strenuous effort to register his or her opinion on election day.

In this state there is going to be a determined effort to defeat Senator La Follette and Governor Blaine, the two men who are pledged to save this state from the rule of corporations.

THE IMMIGRANT

He'd heard this was the land of gold, and gold betokened strife.
They had not mentioned peace to him, or all the joys of life,
They had not told him he should find the children here at play,
'Twas just the lure of yellow gold which set him on his way.

"The land of easy money," that was all he'd ever heard;
Of how we build and keep our homes no one had said a word.
What freedom means he didn't know, for all they'd ever told
Was that our land is very rich and here men gather gold.

But had he learned this land of ours is one of hearts content,
A land where children go to school and romp in merriment,
A land of countless garden plots and homes aglow with cheer,
A higher and a loftier dream would then have lured him here.

I never see an immigrant but what I wonder why
He left the country of his birth—what dream is in his eye?
Oh, did he come for yellow gold, or did he come to give
His children all that freedom means and live as free men live?

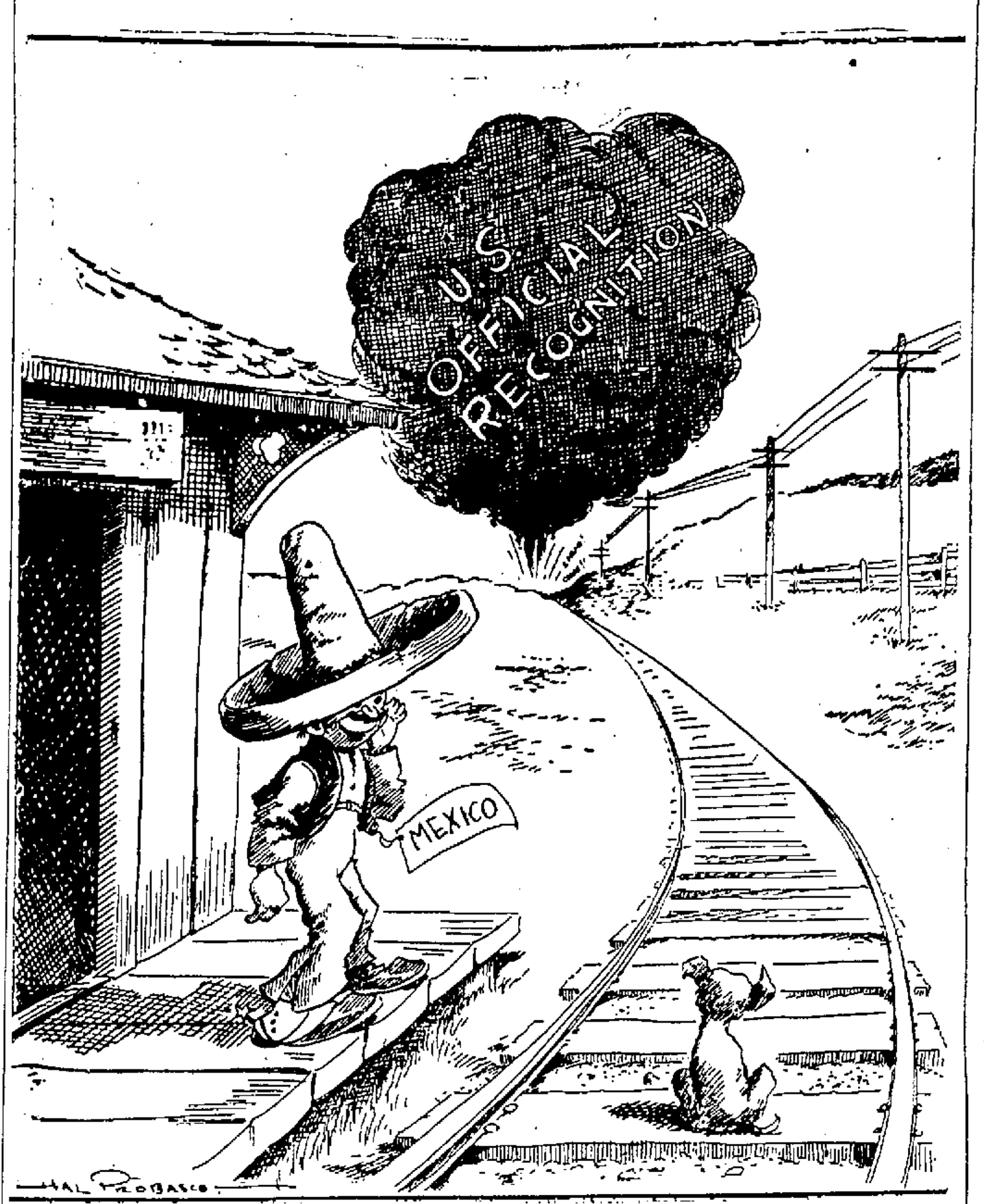
Oh, was he lured by dreams of peace and was his vision filled
With pictures of the little home he hoped some day to build?
And did he come to dwell with us and share the joys we hold,
Or is he but an alien, in search of yellow gold?

Mayor McHenry, of Oshkosh, is again lending his name as a candidate for office; he runs on a wet platform. This platform is an insult to the intelligence of Wisconsin voters, as wet and dry issue is a national one and not a state issue. He can no more change the law than any common voter; therefore his platform is a snare and delusion. Last election he lent his name on the ballot to defeat Thompson, the progressive candidate for senator. He got 40,000 votes, therefore Lenroot was elected. Lenroot is one of the senators who voted to seat Newberry, thereby bringing odium on the fair name of our state of Wisconsin. McHenry's scheme worked so well that now he is willing to stultify his manhood by again running for office; this time for governor, in hopes that Governor Blaine will be defeated in a three-cornered fight. Last election Mc Henry ran for senator; in this election for governor; he seems to be sliding down hill. He will find that voters can be fooled once; but I doubt if he can poll much more than half of what he did last election. When a man is willing to allow his name to be made a cat's-paw of, just to defeat another, there is not much respect felt towards him. Even those who use him usually cast him aside when his name becomes too cheap. The man he is trying to defeat is one of Wisconsin's great men. He is the friend of the farmer and the common people, the foe of corporation rule, and has done more in two years for Wisconsin than was done for a long time before in such a short period of time. The coming year will show a great decrease in taxes, due to his economical administration. Vote for Blaine for governor.

The democrats have nominated a woman for senator. A great many club women feel that Mrs. Hooper should not accept the nomination simply because they cannot support her against Senator La Follette. There should be no six in politics; it should be a matter of principle. Senator La Follette has for years represented Wisconsin at Washington. His vote has always been for human rights. No woman could stand for higher principle than Robert M. La Follette has. There have been times when he stood alone in the United States senate, a target for all that was low and vindictive in man. Wrath has been hurled against him in such strength that most men would have fallen, but he stood as only a righteous man could stand, invincible toward their attacks, for standing behind him were the common people of our beloved state. Their battles he fought; he is their leader, and his voice is but the voice of our people. No woman could do more for the women and children of this country than Robert M. La Follette. When we said child labor must cease in this country, he stood with us in voice and vote. No woman could do more for our soldier boys than he has done. And I doubt if any other man or woman could do as much for universal peace as Robert La Follette has done. He stood for peace when the world was afire with hate and passion and for this the corporations who have made millions from the war pelted him with pellets of hate and derision. In Washington they ostracized him, but he, knowing he was right, walked with head erect, and today, while his persecutors are accused of graft and profiteering, he is honored for being a man, incorruptible, his honesty unchallenged. What higher tribute can be paid to any man or woman? I worked and spoke for years on the question of woman suffrage. I never was so happy as when I first voted, but if I used that vote to defeat a man of principle, just to vote on account of sex, I would not feel that I was worthy to vote. If Mrs. Hooper would wait and run against Lenroot then I would work hard for her. I fear she is a victim of public intrigue, so I will vote for La Follette and Blaine.—Elizabeth L. Cushing, R. 6, Portage Wis.

One report of the wedding said: "Mary Pickford's French maid became quite a nervous wreck with the bustle." We thought women had stopped wearing those darn things.

WAITING FOR THE LIMITED



Success To La Follette

[From The Nation.]

That all the news from Wisconsin points to the success of Robert La Follette at the coming primary must hearten and cheer everybody who believes as does The Nation that in the long run the Americn electorate is certain to recognize merit and unselfish service in its behalf. It means even more than that, for if Mr. La Follette is returned to the Senate it will show that the masses of the people are beginning to come out of the hynotic state in which they were placed by Woodrow Wilson and the war mania, and are beginning to sense how they were lied to, deceived, and misled in the name of democracy and humanity. Against not one was there such a campaign of slander and vile abuse waged as against Senator La Follette. The Associated Press, by accident or by the design of an employee, perpetrated a most atrocious falsehood, a garbling of the Senator's speech in regard to the Lusitania's sinking, which made him say that we had no grievance in that case whereas he had declared the contrary. That any man could survive such a torrent of vilification and misrepresentation is as encouraging as it is amazing. Only five years ago he was being expelled from his clubs, the University of Wisconsin for which he had done so much had turned upon him, the Wisconsin Legislature considered publicly denouncing him, hundreds of his prominent followers left him, practically every Wisconsin newspaper attacked him—all because he exercised what had hitherto throughout our history been deemed the inalienable right of an American, the right to oppose a war policy of his government, a right that had been exercised without serious interference in every war which his country had waged from the Revolution down.

Well, the press of Wisconsin is still, with two exceptions, opposed to Mr. La Follette's fourth renomination and yet every observer privately concedes that so far as indications go he will be returned to Washington—another interesting example of the way our daily press has come to misrepresent the people and also of the way it is losing political influence. More than that, there are plenty of influential men in Congress and in the political life of Wisconsin who in their hearts are praying for La Follette's success. He never lost his hold upon the regard and respect of his associates in the Senate even in the days when many of them ignored him because of their cowardly deference to an hysterical public opinion. They knew then that he was being lynched; many of them, who were as much opposed to our going into the war as he but voted against their consciences, secretly envied him his superb courage and manhood, and these men are eager for his reelection. Again Mr. La Follette has risen to a commanding position in the Senate not only by long service but because of industry, painstaking study of the problems involved, and constant constructive suggestions and measures. His associates know that there is not a mna in Congress who has such an amazing record of having written his policies into law, and they are aware, too, that many of the great capitalists who bitterly opposed his views and his legislation would not today undo the very laws that they once fought and denounced.

Take the Seaman's Law, for instance. Undoubtedly it could be improved here and there in the light of experience, but no sensible man, whether he be ship captain or ship operator, would favor its repeal. Nine-tenths of the prophecies made in regard to it when passed have proved to be folly. It remains an enormous advance in the law of the sea; it has done more to raise the profession of the seaman than anything in the last hundred years. If we succeed in maintaining our new fleet upon the seas with bona fide American-born crews it will be more due to Robert La Follette than to anybody else. As for the rest of the legislation in which Mr. La Follette has been a leader, is there a responsible insurance or railroad official or any self-respecting newspaper editor who would today turn back the hands of time and undo it? Certainly not in Wisconsin, where the laws written upon statute books while La Follette was Governor remain the pride of the State.

The trouble with Senator La Follette, aside from his noble and justified stand against the war, is that he has always been in advance of his times. Nothing could illustrate that more clearly than the fact that in 1908 Mr. La Follette offered thirteen planks for incorporation in the Republican platform. The standpatters indignantly rejected them, yet today twelve of these proposals are law of the land, nine of them by the votes of the party which spurned them with such contumely. Even the thirteenth has been adopted in part. The truth is that the Senator has the deadly quality of persistence and the ability to wait which are the despair of the conservative and the party hack. Rooted in principle, he can afford to wait; time and tide fight with him against all the codes of the human jungle in which he battles. Even now he stands at a point in his career where his long service is about to bring him the reward of placing him more than ever in a position to serve his State and country. If he is reelected he will be the second ranking member of the Interstate Commerce Committee. If Senator Smoot leaves the Senate to take the leadership of the Mormon Church, which is possible, or if he decides to take the chairmanship of the Appropriations Committee, Mr. La Follette will become the chairman of the Senate Finance Committee, the most important position in Congress. The mere prospect of this ought to make every supporter of La Follette work with redoubled energy; it is hardly possible to exaggerate the damage that La Follette could do to the reactionaries who control his party if he should succeed to this position. It is because of this that the whole country has a deeper interest in Mr. La Follette's success than pertains even to the righting of a frightful injustice to him and the reestablishment of these men in public life who dared in April, 1917, to oppose the madness of war which has cost us so dear, plunged all Europe into misery, and transferred the seat of the worst militarism from Berlin to Paris.

What has been the secret of Mr. La Follette's success beyond his own high character? Why nothing else than his unshakable belief in his fellow countrymen and in democracy. He has never swerved in his faith that the cure for the ills of democracy is not less but more democracy. He is the soundest kind of an American patriot, for he is steeped in the real principles of the founders and he has kept as close to the plain people as any man we have had in public life since Abraham Lincoln. From every angle the reelection of this man is of national moment. To our readers who are so situated that they can help we make the most urgent appeal to work for Robert La Follette and not to allow themselves to be lulled into inactivity by the glowing prospect that Wisconsin is going to be true to itself and to America.

On the Side

A LITTLE SLICE O' LIFE

There was a crowd on the street car
And it got bigger at every crossing.
On the back platform there was
A tall gentleman in a frock coat
And a white lawn tie, and he was
A man of great dignity and piety,
If appearances meant anything at all.
He was standing with his back
To the wall of the vestibule,
And as the crowd grew denser
He was crushed up against this wall,
And he bore it with fortitude,
Like one of the early Christian martyrs,
Until there was a sudden jam
And there was a cracking noise,
Like a miniature glass crash,
And the pious looking gentleman
Looked very much perturbed
And the gentle fragrance of
Spirits frumenti filled the vestibule
And a little pool of tan colored
Fluid gathered around his feet,
And he crowded his way out
At the next corner, leaving
A little trail of frumenti
Whcih dripped from his long coat,
And everybody smiled
Rather wistfully.

SLANG OF THE BEACHES

Nobody knows what the wild waves are saying, and it is rather difficult to find what the bathers and dancers along the edge of the big sink are talking about. The shifters, flappers, cake eaters and puddle jumpers who cruised about in town all winter are now down at the shore, and they have invented a new slang. The beach dictionary runs in part as follows:

Oyster: A person who is tight with his money.

Swordfish: Person who is always prying into parties.

Life-guard: A chaperon.

Lifesaving station: A bootleggery.

Shark bait: What they sell there.

Eskimo: A person in a hired bathing suit.

Flounder: A fat lady in the water.

Eel: A dancing gent who knows the new numbers.

Beach comber: Handsome young man on bathing beach.

Weakfish: Any girl who admires a beach comber.

Sand bruise: A dumbbell who is broke.

Barnacle: Young gent who has everything but money.

Sand crab: Young lady who is not interested in men.

Undertow: Summer-resort gin.

Sand spider: A bathing suit censor.

Bluefish: Young lady whose check has not come from home.

Water-lily: Beautiful young lady with no brains.

Gangplank: Old man, who lets his family walk over him.

Smokestack: Flapper who is a habitual cigaret fiend.

Anchor: Rich fiance who has to stay in town.

Bellbuoy: Guy who talks about himself incessantly.

Porgies: Young girls not yet in society.

Mud turtle: Young man interested only in his business. A plodder.

Sea serpent: Attractive widow who charms the men.

Film: A bathing suit.

Rudder: Person who steers the thirsty to a speak-easy.

Boxing the compass: Ordering dinner from hotel bill-of-fare.

Stowaway: Young man who goes to a party without an invitation.

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The Capital Times, Madison, Wis.:

I want to help in extending Progressive Principles in this Campaign. Enclosed please find $......, for which send The Capital Times to the following persons for two months by mail:

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The Capital Times will be sent to any person in Wisconsin for two months for 50 cents.

Published August 14th, 1922

[illegible] to Sections 2394-41 to 2394-70, inclusive, of the Statutes, the [illegible] Commission, on June 5, 1922, repealed General Orders 1000 to 1390, [illegible] which became effective July 1, 1917, and which are collectively [illegible] the Electrical Safety Code. On the same day, it adopted, in lieu [illegible] orders, the following general orders to be known as the Wis[illegible] State Electrical Code:

WISCONSIN STATE ELECTRICAL CODE

Introductory Part

GENERAL REQUIREMENTS, DEFINITIONS, GROUNDING METHODS

Section 100 Application of Orders.

[illegible] 1000. Scope of Code.

[illegible] shall apply as a minimum safety and fire prevention requirement [illegible] electrical and signal places of employment, public buildings, private [illegible] and overhead and underground electrical supply and signal lines now [illegible] installed.

[illegible] Temporary construction may be used for a reasonable length of time if [illegible] competent supervision while it or adjoining electrical equipment is [illegible] is protected by suitable barriers or warning signs when accessible [illegible] without fully complying with this code, but all such construction [illegible] reasonably safe and immediately removed when it has served its

[illegible] which are used exclusively for routine or special electrical test [illegible] therefore, are under the supervision of a qualified person, need [illegible] this code only insofar as is practicable for the character of test-

SECTION 101. GENERAL REQUIREMENTS.

[illegible] 1010. Character of Construction, Maintenance and Operation.

[illegible] electrical equipment and lines shall be of such construction, and so [illegible] and maintained as to minimize the life and fire hazard.

[illegible] 1011. Use of Approved Materials and Construction Methods.

Materials. No materials, employed in construction covered by this [illegible] be used which have not been approved by the Industrial Commis-

[illegible] Materials which comply with the construction details of this [illegible] hereby approved.

Methods of Installation. No methods of installing electrical mater[illegible] in construction covered by this code shall be used which are [illegible] by the Industrial Commission.

[illegible] 1012. Inspection and Repairs.

[illegible] shall be inspected from time to time, cleaned when neces[illegible] if defective shall be promptly repaired or permanently disconnected.

SECTION 102. DEFINITIONS OF SPECIAL TERMS.

[illegible] 1020. Definitions.

[illegible] following definitions give the meanings of some of the terms occur[illegible] these orders; terms not defined will be understood to have their cus[illegible] meanings.

Alive or live means electrically connected to a source of potential dif[illegible] so as to have a potential different from that [illegible] the earth. [illegible] is sometimes used in place of the term "current-[illegible] clear, to avoid repetitions of the longer term.

Automatic [illegible] self-acting, operating by its own mechanism when [illegible] influence; as for example, a change in current [illegible] without personal intervention. Remote control that [illegible] is not automatic, but manual.

Circuit [illegible] a conductor or system of conductors and connected [illegible] to carry an electric current.

Climbing space means the vertical space reserved along the side of a [illegible] structure to permit ready access for linemen to equipment [illegible] thereon.

Conductor means a metallic conducting material, usually in the form [illegible] table for carrying an electric current. In this code when [illegible] of the bus bar type are referred to, they will always be designated

Conduit.

[illegible] underground work means a single duct or a group of ducts for [illegible] conductors.

[illegible] equipment means rigid metal pipe.

Flexible conduit means flexible metal tubing into which the wires [illegible] the tubing has been installed. Armored cable is similar flex[illegible] in which the conductors have been inserted by the manu-

Conflicting or in Conflict, (as applied to a pole line) means that the [illegible] with respect to a second line (except at crossings,) that [illegible] of the first line will result in contact between its poles or [illegible] the conductors of the second line, assuming that no conductors [illegible] either line: Provided, however, that lines on opposite sides of [illegible] street or alley are not considered as conflicting if separated by a [illegible] less than 60 per cent of the height of the taller pole line, but in [illegible] than 20 feet.

Current-Carrying Part Means any part intended to be connected in or [illegible] electric circuit, upon which a voltage is impressed. Noncurrent-carrying [illegible] those not intended to be so connected.

Dead refers to current-carrying parts which are free from electrical [illegible] having a potential different from that of the earth.)

Disconnector means a switch which is intended to open a circuit only [illegible] the load has been thrown off by some other means.

Duct means (in underground work) a single tubular runway for un[illegible] and cables.

Electrical Supply Equipment means equipment which produces, modi[illegible] regulates, controls, or safeguards a supply of electrical energy. Similar [illegible] however, is not included where used in connection with signaling [illegible] under the following conditions:

(a) Where the voltage does not exceed 150.

(b) Where the voltage is between 150 and 400 and the power trans[illegible] does not exceed 3 kilowatts.

Electrical Supply Lines means those conductors and their necessary [illegible] containing structures which are located entirely outside of [illegible] used for transmitting a supply of electrical energy. (See

Electrical Supply Station means any building, room, or separate space [illegible] electrical supply equipment, and which is accessible as [illegible] qualified persons.

Explosion Proof. (As applied to protective inclosures electrical equip[illegible] where the presence of inflammable gas makes the [illegible] character) means that an inclosure is of such con[illegible] of gas which may occur in the inclosure is local[illegible] transmitted to the exterior thereof.

Exposed [illegible] an object or device is not suitably guarded or [illegible] can be inadvertently touched or approached nearer than [illegible]

Grounded [illegible] connected to earth or to some extended conducting [illegible] instead of the earth, whether the connection is intentional

Grounded System means a system having a permanent and effective [illegible] earth. This ground connection may be at one or more

Guarded means covered, shielded, fenced, enclosed, or otherwise pro[illegible] of suitable covers, casings, barrier rails or screens, or by [illegible] platforms, to remove the liability of dangerous contact or [illegible] persons or objects to a point of danger. Wires, which are insu[illegible] otherwise protected, are not considered as guarded.

Handhole means an opening in an underground system into which [illegible]

Household Appliances means flatirons, washing machines, toasters, [illegible] heating pads, and other portable current consuming [illegible] for use in the home and similar places.

Inclosed means surrounded by a case which will prevent accidental [illegible] with live parts. A solid inclosure means one which will [illegible] of flyings or dust, nor transmit sparks or flying [illegible] outside.

Insulated means separated from other conducting surfaces by a die[illegible] permanently offering a high resistance to the [illegible] and to disruptive discharge through the substance or

Insulation (when applied to a material or device such as the covering [illegible] clothing, guards, rods and other safety devices) means [illegible] when interposed between a person and current-[illegible] the person making use of it against electric shock [illegible] parts with which the device is intended to be used.

[illegible] an object is not readily accessible to persons un[illegible] be used.

[illegible] by Elevation means elevated sufficiently so that persons [illegible]

[illegible] Conductor means, in pole wiring work, a wire or cable ex[illegible] direction at an angle to the general direction

[illegible] Space means the space reserved for working between [illegible] climbing space, and to its right and left.

[illegible] one of the wires or cables carrying electric [illegible] towers, or other structures, but not including

Manhole, [illegible] termed splicing chamber or cable vault) [illegible] system which workmen or others may [illegible] cables transformers junction boxes and [illegible] and tests.

Manual [illegible] personal intervention.

Movable Equipment [illegible] electrical apparatus which is heavier than [illegible] but which, nevertheless, is designed to [illegible] for use; equipment which is stationary [illegible] transported from job to job.

New Construction [illegible] new electrical installations and all re[illegible] a substantial portion of the installation

Open Lines [illegible] not in conduits and consisting of [illegible] twisted pairs, as opposed to multiple con-

Panel [illegible] containing busses, fuses, and switches [illegible] devices usually of small individual [illegible] placed in or against a wall or partition and ac-

[illegible] Grounded [illegible] such an effective connection to the earth [illegible] of metallic pipe mains or other suitable [illegible] 17 and 18.

[illegible] of a pole on which cross-arms are attached, [illegible] the companies owning or operating the pole.

[illegible] small electrical apparatus such as grinders, [illegible] with current from a portable connection; [illegible] about or lifted and is intended to be so [illegible] not include household appliances as defined

[illegible] with the construction and operation of the [illegible] Responsibility for the authorization and [illegible] of the employes rests with the employer or his

[illegible] channel for loosely holding wires or cables in in[illegible] expressly and used solely for this purpose. [illegible] (except where expressly forbidden), or in[illegible] term includes wooden and metal moldings consist[illegible] and also metal ducts into which wires are to be

Reconstruction [illegible] rebuilding or remodeling an existing installa[illegible] substantial portion of an installation is New Con-

[illegible] Rural Districts [illegible] all places not urban, usually in the country, [illegible] limits.

[illegible] Sag Apparent [illegible] of a span means the departure of the wire in a [illegible] line between the two points of support of the [illegible] wind loading. Where the two supports are at the [illegible] normalsag.

[illegible] Sag—Apparent sag at any point means the departure of the wire at [illegible] span from the straight line between the two points [illegible] of the span at 60 deg. F., with no wind loading.

Sag—Normal sag means the difference in elevation between the high[illegible] of support of a span and the lowest point of the conductor in the [illegible] 60 deg. F., with no wind loading.

46. Service means the connecting conductors by which a supply of electrical energy is carried from a supply line to main switch and fuses or circuit-breakers within the building or premises served.

Note: This service is ordinarily divided into two parts, one extending from the supply lines to the building line and the other from the building line to the main switch and fuses or circuit-breakers.

47. Signal Lines means lines for public or private signal or communication service and devoted exclusively to the transmission of signals or intelligence, which operate at not exceeding 400 volts to ground or 750 volts between any two points of the circuit, and the transmitted power of which does not exceed 150 watts. Below 150 volts no limit is placed on the capacity of the system.

Note: Telephone, telegraph, messenger-call, clock, fire or police alarm, and other systems conforming with the above are included. Lines used for signaling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so run. Signal lines not for public use coming under the above definition may be constructed and operated as supply lines, if desired, and if consistently so constructed and operated.

48. Substantial means so constructed and arranged as to be of adequate strength and durability for the service to be performed under the prevailing conditions.

49. Switch means a device for opening or closing or changing the connection of a circuit. In these rules, a switch will always be understood to be manually operated, unless otherwise stated.

50. Switchboard means a large single panel or assembly of panels on which are mounted (partly on the face and partly on the back) switches, fuses, busses and usually instruments, and which are accessible both in front and in rear. Circuits and machinery of relatively large capacity are controlled from such boards.

51. Tags mean tags or other markers of distinctive appearance, indicating that men are at work on the equipment or lines so designated.

52. Transformer vault means an isolated, fireproof inclosure, either above or below ground, in which transformers, and the devices necessary for their operation, are installed, and which is not continuously under attendance during operation.

53. Urban Districts means thickly settled communities (whether in cities or suburbs) where congested traffic often occurs. A highway even though in the country, on which the traffic is often very heavy, is considered as urban.

54. Utilization Equipment means equipment, devices, and connected wiring, which utilize electrical energy for mechanical, chemical, heating, lighting, testing, or similar purposes and are not a part of supply equipment, supply lines or signal lines.

55. Vertical Conductor means in pole wiring work, a wire or cable extending in an approximately vertical direction.

56. Voltage or Volts means the highest effective voltage between the conductors of the circuit concerned, except that in grounded multiwire circuits, not exceeding 750 volts between the outer conductors, it means the highest effective voltage between any wire of the circuit and ground.

In ungrounded, low-voltage circuits, voltage to ground means the voltage of the circuit.

When one circuit is directly connected to another circuit of higher voltage (as in the case of an autotransformer) both are considered as of the higher voltage, unless the circuit of lower voltage is permanently grounded.

57. Wire gages. The American wire gage (A. W. G.), otherwise known as Brown & Sharp (B. & S.), is the standard gage for copper, aluminum, and other conductors, excepting steel, for which the steel wire gage (Stl. W. G.), is used throughout these rules.

SECTION 103. METHODS OF PROTECTIVE GROUNDING

Order 1030. General.

The following orders of this section apply to the grounding of all lighting arresters, circuits, equipment and conduit, when the grounding is required as a permanent and effective protective measure by this code.

Exception: The following orders do not apply to the grounding of arresters on signal circuits and radio equipment, to the grounded return or trolley or third rail systems, nor to the grounding of lightning protection wires where these are not connected to electrical circuits or equipment.

Order 1031. Points of Attachment of Ground Conductor to Parts Grounded.

(a) Direct-current Distribution System.

(1) In three-wire direct-current systems the ground connection shall be made on the neutral at one or more supply stations but not at individual services or within buildings served.

(2) In two-wire direct-current systems the ground connection shall be made on one wire at one station only.

(b) Alternating-current Distribution Systems.

(1) In alternating-current distribution systems the ground connection shall be made at the building service or near the transformer (or transformers (either by direct ground connection through water-piping system or artificial ground, or by the use of a system ground wire to which are connected the ground conductors of many secondary mains, and which is itself effectually grounded at intervals that will fulfill the resistence and current-carrying requirements of Order 1035.

(2) In single-phase, three-wire systems the ground shall be on the neutral conductor.

(3) In single-phase, two-wire systems the ground shall be on the neutral point or on either conductor.

(4) In two or three-phase systems the ground shall be made at that point of the system which brings about the lowest voltage from ground to current-carrying parts of connected equipment. Where one-phase of a two or three-phase system is used for lighting, that phase shall be grounded, and at the neutral conductor, if one is used.

(5) In the absence of a direct ground at all building services, ground connections shall be made to the grounded neutral or other grounded conductor of a secondary system supplying more than one utilization equipment, at intervals that will fulfill the resistance and the current-carrying requirements of Order 1035.

(6) When the secondaries of transformers are supplying a common set of mains, fuses if installed shall be located only at such points as not to cause the loss of the ground connections after any fuses in the transformer circuits or mains have been blown.

(7) Alternating-current secondary circuits shall not be grounded inside buildings, except at the service entrance.

(c) Avoidance of Current Flow over Grounded Conductor.

Grounds shall be so arranged that under normal conditions of service there will be no objectionable flow of current over the ground conductor.

(d) Lightning Arresters and Ground Detectors.

For lightning arresters and ground detectors the ground connection shall be at such a point that the ground conductor is as short and straight as practicable.

(e) Equipment and Conduit.

(1) For conduit, frames of generators, motors and transformers, and other noncurrent-carrying metal parts of electrical equipment, the point at which the ground conductor is attached shall be accessible.

(2) For conduit the ground conductor shall be attached near the point where the conductors of the system receive their supply.

(3) If the conduit system is mechanically and electrically continuous, or all disjoined parts are electrically bonded together, a single ground on the service conduit will suffice.

Order 1032. Ground Conductor.

(a) Material and Continuity.

(1) In all cases the ground conductor shall be of copper or other metal which will not corrode excessively, and if practicable, shall be without joint or splice. If joints are unavoidable they shall be so made and maintained as to conform to the resistance and current-carrying capacity requirements of Order 1035.

(2) In no case shall an automatic cut-out be inserted in the ground conductor or connection, except in a ground connection from equipment where its operation will result in the automatic disconnection from all sources of energy of the circuit leads connected to equipment so grounded.

(3) No switch shall be inserted in the ground conductor unless it is in plain sight, and provided with distinctive markings and effectively isolated from unqualified persons.

(b) Size and Capacity.

(1) The ground conductor or conductors for grounding circuits shall have a combined current-carrying capacity sufficient to insure the continuity and continued effectiveness of the ground connection under conditions of excess current, caused by accidental grounding of any normally ungrounded conductor of the circuit. No individual ground conductor for electrical circuits shall have less current-carrying capacity than that of a Number 6 A. W. G. copper wire, except that for additional grounds after the first ground on any circuit, smaller ground wires may be used, provided they have a conductance equivalent to No. 10 A. W. G. copper wire.

The ground conductors for a three-wire direct-current system shall have a combined current-carrying capacity not smaller than the neutral conductor to which they are attached except that the capacity need not be larger than the largest feeder of the same system leaving the station.

The ground conductors for alternating-current system shall have a combined current-carrying capacity not less than one-fifth that of the conductor to which they are atached, except that they need not have a conductance greater than that of Number O. A. W. G. copper wire.

(2) For lightning arresters the ground conductor or conductors shall have a combined current-carrying capacity sufficient to insure continuity and continued effectiveness of the ground connection under conditions of excess current caused by or following discharge of the arrester. No individual ground conductor shall have less conductance than Number 6 A. W. G. copper wire.

For noncurrent metal parts of electrical equipment, except conduit, armored cable or metal race-ways the conductance of a ground conductor shall be not less than that provided by a copper wire of the size indicated in the following table:

Capacity of Nearest Automatic Cut-out	Required size of Ground Conductor—A. W. G.
200 to 500 amperes	
100 to 200 amperes	
0 to 100 amperes	
0 to 10 amperes (for portable equipment only)	

When current-carrying conductors of portable equipment are larger than No. 18 A. W. G. ground conductor must be of same size.

When there is no cut-out protecting the equipment, the size of ground conductor shall be determined by the design and operating conditions of the circuit.

(4) Ground wires for conduits shall have a conductance at least equivalent to No. 10 A. W. G. copper wire, where largest wire contained is No. 0 A. W. G. copper wire or less. A ground wire of a conductance at least equivalent to Number 4 A. W. G. copper wire shall be used where largest wire contained is larger than No. 0 A. W. G. copper wire.

(c) Insulation and Guarding.

(1) All ground conductors of circuits or equipment operating at less than 750 volts shall be adequately insulated for the voltage of the circuits or equipment grounded.

Exception: Substantial bare ground conductors may be used in stations, and bare wires may be used if laid slack underground.

(2) When within eight feet of the earth, platform or floor from which ground conductors are accessible to unauthorized persons or the public, or when exposed to mechanical injury, ground conductors shall be protected by adequate guard.

(3) Guards for lightning arrester ground conductors shall be of non-magnetic material unless the ground conductor is electrically connected to both ends of the guard.

(4) The ground conductor, except in rural districts, shall be guarded by being inclosed in insulating conduit or molding, if connected to an artificial ground.

Order 1033. Nature of Ground Connection.

(a) General. The ground connection shall be permanent and effective and shall be made as indicated below, but always to water piping systems if they are available.

(b) Piping Systems.

(1) In supply stations, ground connections for circuits, equipment and arresters shall be made to all available active metallic underground water piping systems between which no appreciable difference of potential normally exists, and to one such system if appreciable differences of potential do exist between them.

(2) In other places ground connections shall be made to at least one such system.

(3) Gas piping systems shall not be used for making ground connections.

Exception: Where connection to another type of ground from an electric or combination lighting fixture would involve a long run, and the fixture therefore is not within reach of plumbing or other grounded surfaces, the gas piping may be utilized as the ground connection, provided it is bonded to the water piping system at its point of entrance to the building.

(c) Alternate Methods. Where underground metallic piping systems are not available, other methods which will secure the desired permanence and conductance shall be employed.

(d) Artificial Grounds. When resort must be had to artificial grounds their number shall be determined by the following requirements:

(1) No more than one such ground is required for lightning arresters, except where for large current capacity. At least two grounds are required for low voltage alternating-current distribution circuits at transformers or elsewhere.

(2) Where no part of the circuit or equipment protected can be reached by persons while they are standing on the ground or damp floors, or by persons while touching any metallic piping to which the ground wire is not effectively connected, a single artificial ground may be used even if the resistance exceeds that specified in Order 1035. (In such cases it is desirable to provide guards for the ground conductor in accordance with Order 1032c wherever it is otherwise accessible, or to provide insulating mats or platform so located that persons cannot readily touch the ground conductor without standing on such mats or platforms.)

(e) Grounds to Railway Returns. Protective ground connections for circuits other than railway circuits shall not be made to railway negative return circuits.

Order 1034. Method of Connecting to Ground.

(a) Water-Piping Connections. Ground connections to metallic piping systems shall be made (except as permitted below) on the street side of water meters, but connections may be made immediately inside building walls to secure accessibility for inspection and test.

Exception: When water meters are located outside buildings or in concrete pits within buildings where piping connections are imbedded in concrete flooring, the ground connections may be made on the building side of the meters, if meters are suitably shunted.

When the making of a ground to a piping system outside meter or other device would involve a long run, connection for equipment or conduit (but not for circuits) may be made to the water-piping system at a point near the part to be protected, provided there are no insulating joints in the pipe to prevent a good ground. In such cases, care should be taken to electrically connect all parts of the piping system liable to create a hazard (if they become alive) and to shunt the pipe system where necessary around meters, etc., in order to keep the connection with the underground piping system continuous.

(b) How to Make Connection. The ground connection to metallic piping systems and conduit shall be made in such a manner that good electrical contact between the ground wire and pipe surface is secured, and that the possibility of increase in resistance of the joint through corosion is minimized.

(c) Artificial Grounds. Artificial Grounds shall be located below permanent level where ground water level is close to the surface. Where it is impossible to locate the artificial grounds below permanent moisture level, they shall be at least 6 feet below the surface:

Order 1035. Ground Resistance.

(a) Limits. The combined resistance of the ground wires and connections of any grounded circuit, equipment or lightning arrester shall not exceed the values given below:

Amperes	Water Pipe Grounds Ohms	Artificial Grounds Ordinary Soils Ohms
Less than 10	15	25
10 to 25	6	25
25 and below	3 or less	25

Exception: Where because of dry or other high-resistance soils it is impracticable with artificial grounds to obtain resistances as low as the values given above for ordinary soils, two grounds as defined in Order 1033d should be installed and no requirements will be made as to resistance, except as (b) below.

(b) Checking.

(1) The resistance of station grounds shall be checked when made.

(2) All ground connections shall be inspected periodically.

Order 1036. Separate Grounds and Ground Conductors.

(a) Ground Conductor. Ground conductors shall be run separately to the ground (or to a sufficiently heavy grounding bus or system ground cable which is well connected to ground at more than one place) from equipment and circuits of each of the following classes:

1. Lightning arresters.
2. Secondaries connected to low voltage lighting power circuits.
3. Secondaries of current and potential instrument transformers and cases of instruments on these secondaries.
4. Frames of direct-current railway equipment and of equipment operating in excess of 750 volts.
5. Frames of utilization equipment, conduit systems, etc., other than covered by Item 4.
6. Lightning rods.

(b) Arrester Grounds. Lightning-arrester ground connection shall not be made to the same artificial ground (driven pipes or buried plates) as circuits or equipment, but should be well spaced and, where practical, at least 20 feet from other artificial grounds.

PART I.

ELECTRICAL SUPPLY STATIONS, SUBSTATIONS AND EQUIPMENT

SECTION 110. SCOPE OF ORDERS

Order 1100. Stations and Substations.

The following orders (1100 to 1199 inclusive) apply to all electrical supply equipment of indoor and outdoor stations and substations.

Order 1101. Electrical Supply Equipment in Factories.

Orders 1100 to 1199 inclusive also apply to electrical supply equipment, including generators, motors, storage batteries, transformers and lightning arresters installed in factories, mercantile establishments, or elsewhere, provided the equipment is in separate rooms or inclosures, under the control of properly qualified persons, whose attention is not distracted by other processes, and provided such rooms or inclosures are accessible only to such persons.

SECTION 111. GENERAL PROTECTIVE ARRANGEMENTS OF STATIONS AND SUBSTATIONS

Order 1110. General Requirements for Rooms and Spaces.

(a) Not to be used for Storage of Materials. Rooms and spaces in which electrical supply equipment is installed shall not be used for the storage of material nor for manufacturing processes.

Exception: Materials or processes incidental to the production or distribution of a supply of electrical energy are exempted.

(b) To be Dry and Free from Flyings and Inflammable Gases. Such rooms and spaces shall be free from flyings and inflammable gases, and when indoors shall be dry and well ventilated.

Order 1111. Illumination of Stations and Substations. (See also Order 1144—e.)

(a) Intensity of Artificial Illumination. Rooms and spaces in which electrical supply equipment is installed shall be provided with artificial illumination of an intensity at least equal to the minimum foot-candles of the following table:

	Minimum Foot-Candles	Modern Practice Foot-Candles
(1) Switchboard instruments, gauges, switches, etc.	1	2 to 4
(2) Switchboards with no exposed live parts	½	1 to 2
(3) Storage battery room	½	1 to 2
(4) Generating room, boiler room, pump room (at machinery, or exposed live parts)	1	2 to 4
(5) Stairways and passageways (measurements made at floor level), where there is moving machinery, exposed live parts, hot pipes, etc.	1	2 to 4
(6) Any traversed space (measured at floor level)	¼	1 to 2

Note: The above illumination values apply to the working surfaces and measurements are to be made on the vertical, horizontal, or intermediate plane, as may be required.

The "minimum foot-candles" specify the lowest illumination for safety, but the "modern practice foot-candles" are recommended.

(b) Fixtures and Plug Receptacles.

(1) Lamps and fixtures shall be so located as to be readily accessible for replacement, trimming, cleaning, etc., and shall have their control readily accessible.

(2) Lamps and fixtures shall be so located as to make unnecessary the use of portable cords in dangerous proximity to live electrical equipment.

(c) Emergency Lighting. A separate emergency source of illumination shall be provided in every station where an attendant is located. This source shall be from an independent generator, storage battery, gas main, or other suitable source.

(d) Shading of Lamps. Overhead and local lamps shall be shaded as required by Orders 2113 and 2114 of the industrial lighting code.

Order 1112. Requirements for Buildings and Yards and General Safety.

(a) Buildings to Comply with Building Code. Buildings in which electrical supply equipment is installed shall be constructed in every detail to comply with the Building Code.

(b) General Orders on Safety to be Complied With. Floors, passageways, stairways, floor openings, platforms, runways, moving machinery, etc., shall be constructed and safeguarded as required by the General Orders on Safety.

(c) Exits. All such rooms shall have proper exits as called for by the Building Code.

(d) Protection from Rain and Falling Objects. Electrical supply equipment located outdoors when necessary, shall be protected against injury from rain, snow, sleet, flying or falling objects.

Order 1113. Fire Fighting Appliances. Each room or space, where an operator is in attendance, shall be provided with fire-extinguishing appliances of a type which may be safely used on live parts.

SECTION 112. PROTECTIVE ARRANGEMENTS OF ELECTRICAL SUPPLY EQUIPMENT

Order 1120. Guarding Live Parts.

(a) Equipment.

All ungrounded current-carrying parts of equipment shall be suitably guarded if elevated less than the following distances above floors or platforms:

Voltage of Part	Elevation in Feet
100 to 750	7.0
2,500 to 7,500	8.0
750 to 2,500	7.5
7,500 to 80,000	9.0
30,000 to 70,000	10.0
70,000 to 100,000	12.0
Over 100,000	14.0

Exception: Where no guards are called for elsewhere in these orders, uninsulated current-carrying parts operating at less than 7500 volts need not be guarded regardless of elevation, if the following conditions are complied with:

(1) Insulating mats or platforms are to be provided.

(2) If there are such live parts operating at 300 to 750 volts on one side of the space, there shall be a minimum clearance of 2.5 feet; if on two sides, 3 feet.

(3) If there are such live parts operating at more than 750 volts on one side of the space, there shall be a minimum clearance of 3 feet; if on two sides, 5 feet.

(2) Where guards must at times be opened, thereby exposing live parts, they shall be of insulating material or so arranged that they cannot readily make contact with live parts while being removed.

(3) Where persons must at times enter inclosures, while such parts are alive, the guards shall be of insulating material, or insulated from ground, unless removed horizontally 3 feet, for voltages up to 750, and 5 feet or more, for higher voltages.

(4) All such live parts of equipment of outdoor stations and in stations located in tunnels or subways, shall be inclosed in weather proof cases.

Exception: Equipment designed to withstand the prevailing atmospheric conditions and which has the live parts suitably guarded against contact, or isolated by elevation is exempt.

(b) Generators, Motors, Motor-generators and Converters.

(1) Insulated steps or platform with insulated handrails, if necessary, shall be provided on or about large machines, operating at voltages which will admit of adjustment of live parts, to afford ready access to these parts.

(2) With machines having exposed live parts above 300 volts to ground insulating mats or platforms shall be so placed that operators cannot readily touch live parts unless standing on the insulating mats or platforms.

(3) Machines having exposed live parts above 750 volts to ground, shall have suitable inclosing or barrier guards in addition to the mats or platforms called for in (2) above.

(c) Storage Batteries.

The arrangement of cells and connections shall be such that no two current-carrying parts between which a voltage exceeding 150 volts exists, shall be closer than 3 feet.

Exception: If the parts are not so exposed that persons are liable to make accidental contact with both at the same time, a lesser spacing is permissible.

(d) Switches, Fuses, Circuit-Breakers.

(1) All switches interrupting circuits over 750 volts shall be of the remote-control type or shall be inclosed in casings which permit of operation without opening the inclosure, thereby protecting the operator at all times against danger.

(2) All switches interrupting circuits below 750 volts shall be provided with insulating handles and suitable insulating guard disks or shields so arranged between the handles and the live parts as to prevent the hand from slipping into contact with live parts or being burned by arcing at the switches.

Exception: Switches interrupting circuits below 300 volts are exempted from this order.

(3) All fuses and circuit-breakers on circuits over 750 volts which are not isolated by elevation in accordance with a1 above, shall have all current-carrying parts inclosed.

(4) Where live parts of switches, operating at more than 300 volts to ground, are not remotely controlled or inclosed, as permitted in (2) above, insulating floors, mats, or platforms shall be so placed that the operator must stand on them while operating the switches or adjusting fuses and circuit-breakers.

(5) When switches, disconnectors and fuses above 750 volts which are ordinarily guarded or isolated by elevation as required by a-1 above must occasionally be operated without such protection, adequate working space shall be provided so that the operator will not be required to bring any part of his body within the following distances of the part:

	Distance in Feet
750 to 7,500	1
7,500 to 30,000	2
30,000 to 50,000	3
50,000 to 70,000	4
70,000 to 100,000	5
Above 100,000	6

(e) Switchboards. See also Order 1142.

(1) All switchboards located near passageways shall be guarded from these by suitable inclosures or barriers and shall be made inaccessible to other than authorized persons. Spaces at rear of switchboards, which might be used as passageways, shall be inclosed by screens or barriers at ends of board.

(2) Insulating floors, mats or platforms shall be so placed at front and rear of boards, having exposed live parts, operating at more than 300 volts to ground, that the operator must stand on them while operating or working at the switchboard apparatus.

(3) There shall be no exposed ungrounded current-carrying parts on the face of any switchboard, operating at voltages over 750 volts, at an elevation less than 7.5 feet above floor or platform.

Exception: (1) Direct-current railway boards up to 1500 volts, so constructed that the operator cannot inadvertently come in contact with parts having a difference of potential over 300 volts, are exempted from this order.

(4) Exposed ungrounded current-carrying parts over 750 volts on back of switchboards, when not isolated by elevation in accordance with a-1 above, or when working spaces called for in exceptions to a-1 are not possible, shall be guarded. Parts above 7500 volts shall be isolated as required by a-1 above or shall be guarded.

(5) Plug-type switchboards shall have no exposed current-carrying parts on the face of board in excess of 150 volts to ground, except at times of making or breaking connections.

(f) Lightning Arresters.

(1) Current-carrying parts of lightning arresters shall be isolated as required by a-1 above or guarded.

(2) Lightning arresters on circuits of 7500 volts or more shall be provided with disconnectors.

(g) Conductors.

(1) Conductors operating at voltages over 750 volts, when brought closer to the floor line than the distances specified in a-1 above, or where subject to mechanical injury, shall be guarded by permanent screens, by inclosing partitions, barrier, guards or by inclosure in metal conduit, metal ducts, runways or compartments of tile bitumenized fiber concrete or other suitable fire-resistive materials.

(2) All conductors shall be adequately insulated for the voltage of the circuit to which they are connected.

Exception: Bus-Bars and similar conductors are exempted from this provision but must be constructed as required by the other provisions of this Order.

(3) Where conductors with insulating coverings are closely grouped, as on the rear of switchboards or in cable-ways, they shall each have a substantial flame-proof outer covering.

(4) Large uninsulated conductors liable to be torn from their supports by the stresses to which they are subjected (as by the magnetic field produced,) shall be so supported that they cannot come in contact with the surfaces along which they are run if insulated or with other conductors whether insulated or not.

(5) Ungrounded conductors of outdoor stations and stations located in tunnels or subways, when not run in conduit, shall be installed on suitable insulators, and properly guarded or isolated by the elevations of (a-1) above, except metallic sheathed cables having metallic sheath permanently and effectively grounded.

(h) Separation and Barriers. All bare parts at different potentials shall be effectively separated, and on circuits of large capacity or operating at 7500 volts or higher, if liable to short-circuiting by tools or other conducting objects, shall be provided with suitable barriers.

Order 1121. Hazardous Locations.

In damp locations, or where explosives and inflammables exist in dangerous quantities, the equipment shall be installed as called for in Order 1312, Section 113 of Part 3.

Order 1122. Grounding.

(a) General.

Circuits shall be grounded as required by Order 1313, Section 121 of Part 3.

Exception: Station auxiliary alternating current systems are exempted from this requirement.

(b) Instrument Transformers.

The low-voltage circuits of all instrument transformers shall be permanently grounded unless the circuits are installed, guarded and plainly identified as required for the high-voltage circuits of the transformers.

Note: Sometimes this will require marking to distinguish such a low-voltage circuit from others which are protected by a ground.

(c) Non-current-Carrying Metal Parts.

Exposed non-current-carrying metals parts, of equipment operating at voltages above 100 volts to ground, shall be grounded in accordance with the methods set forth in Section 103 of Introductory Part.

Exceptions:

(1) All equipment in locations where there are no exposed grounded surfaces within the reach of persons when touching the parts under consideration and where none of the conditions listed as hazardous in Order 1312 exist, and provided the voltage at which the equipment operates is less than 150 volts to ground is exempted from this order.

(2) All equipment accessible only to qualified persons, provided it is effectively insulated from ground, providing insulating mats, platforms or floors are present, on which qualified persons may stand, and provided there are no exposed grounded surfaces within reach of said qualified persons, at such times as said qualified persons may be in contact with any live part, is exempted from this order.

(3) Exposed non-current-carrying metal parts of supply equipment of grounded direct-current circuits or series direct-current curcuits are exempted from this order, if suitably insulated from the ground and from neighboring grounded surfaces. In addition suitable permanent insulating barrier guards shall be installed so that a person cannot, while touching such insulated frames, at the same time inadverently touch or stand upon other grounded bodies.

(4) Metal parts such as name-plates and card-holders on switchboards, not likely to become alive by leakage from live parts, are also exempted from this order.

(5) Metal cases of instruments, which are isolated in accordance with Order 1120-a are exempted from this order.

(6) Exposed non-current-carrying metal parts of supply equipment for signal circuits are exempted from this order, providing they are suitably insulated from the ground and neighboring grounded conductors and surfaces.

(7) Metal shell sockets and metal guards of portable lamps, if suitably insulated, are exempted from this order.

(d) Lightning Arresters and Ground Detectors.

Lightning arresters and ground detectors shall be grounded in accordance with the methods set forth in Section 103 of the Introductory Part.

Order 1123. Identifications. All electrical supply equipment shall be suitably marked to indicate the voltage, capacity, intended use, and other essentials for safe operation.

Order 1124. Deteriorating Agencies. Suitable guards or inclosures shall be provided to protect exposed current-carrying parts, insulation of leads, balance coils, or other electrical devices belonging to motors and generating equipment, where installed directly under other equipment or in locations where dripping oil, excessive moisture, steam, vapors, or similar injurious agents exist.

SECTION 113. INSTALLATION AND PROTECTION OF WIRES. INSTALLATION OF CONDUIT AND OTHER INCLOSURES FOR WIRES. CABINETS AND JUNCTION BOXES.

Order 1130. Compliance with Other Orders. The installation of all conduit, both rigid and flexible, meal surface raceways, armored cables, cabinets and junction boxes, and the installation and protection of wires shall be made to comply with Sections 133 and 134 respectively of Part 3 and in addition shall comply with the following orders of this section.

Order 1131. Station Wiring Requirements.

(a) Conduits, Ducts and Runways. The interior of conduits, ducts and runways shall be smooth, and all edges at outlets shall be smooth to prevent abrasion of the insulating covering of the wires.

(b) Open Wiring. All open wiring shall be exposed to view.

(c) Lead-sheathing and Flame-proofing Covering where Conductors Terminate. Where conductors terminate, lead-sheathing and flame-proofing covering, when used on conductors, shall be stripped back on the conductors a sufficient distance from the terminals to give the necessary insulation for the voltage of the circuits on which the conductors are used.

(d) Potheads on Circuits above 750 Volts. On systems above 750 volts the insulation of the several conductors, where leaving the metal sheath of cables, shall be thoroughly protected against moisture and mechanical injury by means of potheads or other equivalent means.

(e) Taping Ends and Joints. Ends and joints of insulated conductors, unless otherwise adequately guarded, shall have equal insulating covering with other portions of the conductor.

SECTION 114. SWITCHES, DISCONNECTORS, FUSES, CIRCUIT-BREAKERS, SWITCHBOARDS, LIGHTNING ARRESTERS AND STORAGE BATTERIES.

Order 1140. Switches and Disconnectors.

(a) Compliance with other Orders. The installation of all switches and disconnectors shall be made to conform to Order 1350, Section 135 of Part 3, except as otherwise provided in this order and Order 1120 d and e.

(b) Where Switches are Required. Suitable switches shall be inserted in all leads to generators, motors, transformers and all out-going and incoming supply circuits.

Exception: (1) Grounded conductors and leads to insrtument transformers and instruments are exempted from this order.

(2) In cases such as between generators and transformer banks used with the generators, disconnectors only will be required.

(3) Where two or more pieces of electrical supply equipment or supply lines are operated as a single unit no switch is required between them.

(4) In underground manholes or in transformer vaults, switches are not required, if not deemed necessary to meet operating requirements.

(5) Automatic circuit-breakers that disconnect all wires of the circuit may serve as switches for motors.

(c) **Switches for Short-Circuiting and Grounding.** Switches or other suitable means shall be provided to facilitate short-circuiting and grounding equipment or lines for which the operating rules (Part 4) require such protection to workmen.

(d) **Where disconnectors are Required.** Switches, which do not make an air break, or circuits operating at voltages in excess of 750, shall be protected by disconnectors between them and the source of energy supply.

Order 1141. Automatic Overload Circuit-Breakers and Fuses. See also Order 1120-d).

(a) **Compliance with Other Orders.** The installation of all circuit-breakers and fuses shall be made to conform to Order 1351, Section 135 of Part 3, except as otherwise provided in this order and Order 1120-d and e.

Exception: Open link fuses may be used in stations and substations. (See also Order 1351-b, Section 135, Part 3).

(b) **To be installed in all Leads.** Automatic overload circuit-breakers or fuses shall be installed in all leads where switches are required by Order 1140-a and the appended exceptions.

Exceptions: (1) Switches between alternating-current generator and station bus-bar need not have over-load protection.

(2) Series transformers and constant current circuits are exempted from this order.

(c) **Locations.**

(1) Such automatic overload protective devices shall be installed as near as practicable to the bus-bars.

Exception: Where there are no bus-bars these automatic overload protective devices shall be installed as near as practicable to the point where the conductors enter the station.

(2) On circuits of indoor stations operating at voltage in excess of 7500 volts, oil-circuit-breakers shall, where practicable, be inclosed in separate fireproof cells or compartments, or shall be separated by suitable barri ––.

Order 1142. Switchboards.

(a) Accessibility and Convenient Attendance.

(1) All switches on switchboards shall be so arranged that the points of control are readily accessible to the operator.

(2) Instruments, relays and other devices requiring reading or adjustment shall be so placed that work can be readily performed from the working space.

(b) Location.

(1) Switchboards shall be so placed that the operator will not be endangered by any live or moving parts of machinery or equipment located near the board.

(2) There shall be a space of three feet between top of switchboard and combustible material, unless switchboard is otherwise properly guarded to prevent igniting combustible material.

(3) Switchboards shall be accessible from front and rear when the connections are on the back.

(c) **Required Equipment and Construction.**

(1) Switchboards which control outgoing supply circuits shall be equipped with such instruments as are necessary to show operating conditions.

Exception: Switchboards in substations without regular attendance are exempted.

(2) Switchboards shall be made of non-combustible material.

(3) In wiring switchboards, the ground detector, volt-meter, pilot lights and potential transformers shall be properly protected by fuses.

(d) Arrangement and Identification.

(1) Connections, wiring and equipment of switchboards and panel boards shall be arranged in an orderly manner.

(2) All switches and automatic cutouts shall be plainly marked, labeled or arranged so as to afford ready means for identifying circuits or equipment supplied through them.

(e) Spacings and Barriers Against Short Circuit.

(1) The number of bare parts on switchboards which are at different potentials, shall be as few as possible, and shall be effectively separated.

(2) Where the voltage between bare parts exceeds 750, suitable non-combustible barriers shall be used between them, isolated by elevation or so located as not to be liable to be short circuited or grounded by tools or other devices.

(3) Fuses shall be so located as to minimize the danger, in removing or replacing them, of short-circuiting parts at different potentials by either the fuses or the hands of the operator.

(f) Means Required to Readily Make Occasional Grounds.

Where protective grounds are occasionally required on circuits for the protection of workmen, a permanent ground connection shall be provided and also suitable means for effectively and readily connecting the parts to be grounded to the ground connection.

(g) **Ground Detectors.**

Each ungrounded distribution system in a station under attendance shall be provided with reliable ground detectors.

Order 1143. Lightning Arresters.

(a) Where Lightning Arresters are Required. All overhead lines to stations shall be protected by lightning arresters.

(b) Location. Lightning arresters, when installed inside of buildings, shall be located as far from all other equipment and combustible parts of the buildings as practicable.

(c) Provisions for Disconnecting.

(1) On circuits over 7500 volts, lightning arresters shall be so arranged, isolated and equipped that they may be readily disconnected from outside conductors to which they are connected by air-break manual disconnectors, having air gaps of not less than four times the equivalent needle point sparking distance of the operating voltage of the circuit to which the arresters are connected and in no case less than eight inches.

(2) Such disconnectors shall be remotely controlled and operated or shall have the adjacent working space required by Order 1120-d-5.

(d) Choke Coils. All choke coils or other attachments, inherent to the lightning protection equipment, shall have an insulation from the ground or other conductors equal at least to the insulation demanded at other points of the circuit in the station.

Order 1144. Storage Batteries.

(a) Scope of Order. This order applies only to storage batteries exceeding 50 kilowatt hours capacity at the eight-hour rate of discharge.

(b) Isolation. Storage batteries shall be placed in separate rooms or inclosures, accessible only to properly qualified persons.

(c) Ventilation.

(1) Such rooms or inclosures shall be so ventilated as to remove acid spray and prevent dangerous accumulation of inflammable gas.

(2) Communication of drafts to other rooms shall be prevented.

(d) Suitable Supports and Floors.

(1) The cells shall be supported by suitable insulators.

Exception: Small cells of insulating material are exempted.

(2) Suitable drainage or other means shall be provided beneath cells to prevent accumulation of electrolyte in case of leakage or spraying.

(e) Lamps.

(1) Lamps inside storage-battery rooms shall be of the electric incandescent type, inclosed in vapor tight globes.

(2) Switches controlling such lamps shall be located outside of the battery room or shall be of the vapor-proof type.

(f) Acid-Resistive Coverings on Conductors. Conductors in battery rooms, if of such material or so located as to be liable to corrosion, shall have suitable protective coverings or coatings.

SECTION 115. ROTATING EQUIPMENT, TRANSFORMERS, REACTANCES, INDUCTION REGULATORS, BALANCE COILS AND SIMILAR EQUIPMENT

Order 1150. Rotating Equipment.

(a) Speed-Limiting Devices.

(1) Prime movers driving generating equipment shall be protected with automatic speed-limiting devices where harmful overspeed can otherwise occur.

(2) Such devices shall be in addition to their governors, if necessary, as with some types of turbines.

(3) Separately excited direct-current motors, series motors, motor generators and converters shall have protective devices as required by Order 1357-c, Section 135 of Part 3.

(b) Stopping Devices. Stopping devices, such as switches or valves which can be operated from locations convenient to machine operators, shall be provided for prime movers or motors driving generating equipment.

(c) Control Circuits to be in Conduit. Where speed limiting or stopping devices or remote control switches are electrical operated, the control circuits, by which such devices are actuated, shall be in conduit or otherwise suitably protected from mechanical injury.

(d) Motors. All motors shall be installed in the manner required by Order 1357, Section 135 of Part 3.

(e) **Generators.**

(1) Constant potential direct-current generators, shall be protected from excessive current by fuses or equivalent device of proper design.

Exception: Public utilities serving lighting systems need not place overload protection between lighting generators and bus-bars where two or more generators operate in parrallel or feed into network supplied from other sources, if reverse current relays are installed.

(2) For ~~two~~-wire direct-current generators, used in conjunction with balancer sets to obtain a neutral for three-wire systems, a protective device shall be installed, which in case of excessive unbalancing of voltages will operate to disconnect the balancer set and the connected three-wire system.

(3) For three-wire direct-current generators compound or shunt wound, a safety device shall be placed in each armature lead, and also connected as to receive the entire current from the armature. Such safety device shall be so interlocked that no one pole can be opened without simultaneously disconnecting both sides of the armature system.

Exception: If such generators are designed to safely carry on each side of the three-wire system the maximum load that may be placed upon it by the opening of one of the outside lines and the carrying capacity of the neutral wire will not be exceeded by such load the safety device need not be interlocked.

Order 1151. **Transformers.**

(a) Location. Transformers shall be so placed that fire and smoke from the burning out of the coils or boiling over of the oil (where oil-filled cases are used) can do no harm.

(b) **Current Transformer Secondary Circuits.**

(1) Secondary circuits of current transformers, including constant current and instrument transformers, shall be provided with means for short-circuiting them, which can be readily connected while the primary is energized and which are so arranged as to permit the removal of any instrument or other device from such circuits without opening the circuits.

Exception: Current transformers supplying relays only, or those having their primary circuits always disconnected before the secondary circuits are worked on, are exempted from this order.

(2) Where primaries are more than 7500 volts, secondary circuits, unless otherwise adequately protected from injury or contact of persons, shall be in permanently grounded conduit.

PART 2.

ELECTRICAL SUPPLY AND SIGNAL LINES

SECTION 120. SCOPE OF ORDERS AND GENERAL REQUIREMENTS.

Order 1200. Scope of Orders.

The following orders 1201 to 1299 inclusive apply to all electrical supply and signal lines in overhead and underground construction.

Order 1201. Design and Construction.

All electrical lines and equipment shall be of suitable design and construction for the service and conditions under which they are to be operated and all lines and appurtenances thereof shall be constructed and maintained in accordance with good modern practice.

Order 1202. Lines Temporarily Out of Service.

Lines temporarily out of service shall be inspected and maintained as though in service.

Order 1203. Lines Permanently Abandoned.

If any support, attachment or conductor of an overhead line has been permanently retired from service, the same shall be removed by its owners.

Exception: Overhead service drops may be disconnected from the circuit and allowed to remain in place when service is discontinued if it is undesirable to remove the service drops.

Order 1204. Isolation, Guarding and Marking.

(a) **Current-Carrying Parts.**

Conductors and other current-carrying parts of electrical supply lines shall be so arranged as to provide adequate clearance from the ground or other spaces generally accessible to the public and to the employees not authorized to approach such parts or shall be provided with guards so as to effectively isolate them from accidental contact by such persons.

(b) **Noncurrent-Carrying Parts.**

In urban districts, ungrounded metal-sheated service cables, service conduits, metal fixtures, and similar noncurrent-carrying parts where liable to become charged to more than 300 volts to ground shall be so isolated or guarded as not to be exposed to accidental contact by unauthorized persons. Metal poles not guarded or isolated shall always be specially grounded where in contact with metal sheathed cable or metal cases of equipment operating at more than 750 volts.

(c) **Marking of Pole Carring High Voltages.**

(1) When poles or structures carrying voltages of 6000 or more are within 100 feet of any school, within 100 feet of any place where such line crosses a public highway or within the corporate limits of any city or village, warning signs shall be placed on all such poles or supporting structures of such line.

(2) Every such sign shall be stencilled on such pole or structure in black or red letters not less than two inches high on a white background and shall read DANGER HIGH VOLTAGE.

(d) **Stepped Poles.**

If supply conductors carrying voltages exceeding 300 volts to ground are carried on poles stepped nearer than 6.5 feet from the ground or from other readily accessible space or on closely latticed poles or towers, guards or warning signs shall be used to protect against careless approach to conductors by unauthorized persons.

Exception: On poles carrying signal cable or twisted pairs below supply conductors one wood block may be placed not less than 3.5 feet from the ground or other readily accessible place without the use of guards or warning signs.

Structures on fenced right of way need not comply with the requirements of this order.

Orders 1205. Grounding Circuits and Equipment.

(a) Methods.

Permanent grounding for lightning arresters, for circuits, for equipment, and for wire runways shall be done according to the requirements of orders of section 103, and order 1313, Section 131, Part 3, except for signal circuit arresters, for which see order 1391-g and h, Section 139 Part 3.

(b) Conduit, Cable Sheaths, Hangers, Etc.

In urban districts metal conduits, cable sheaths, frames, cases and hangers of equipment shall be permanently and effectively grounded.

Exceptions: The above requirements need not be met when such equipment is:

(1) Guarded from accidental contact of by unauthorized persons,

(2) Eight feet or more from the ground or grounded surface,

(3) When metal conduit and cable sheaths enclosing signal conductors or supply conductors (of not more than 300 volts to ground) are n– –xposed to probable contact with circuits of more than 300 volts to ground.

Order 1206. Arrangement of Switches and Identification of Equipment.

(a) Switches to be indicating.

All switches shall be readily accessible to authorized p–r–ons –nd shall indicate clearly whether open or closed.

(b) Uniform Position.

To minimize operating errors the handles or control mechanism for switches throughout any system, shall have the same position when open, and a uniformity position when closed.

Exception: When this is impracticable the switches should be so marked as to minimize the liability to mistakes in operation.

(c) **Location of Conductors.**

All conductors and equipment of electrical supply and signal lines shall be arranged to occupy definite positions, as far as practicable, throughout the system or should be so constructed, located, marked or numbered as to facilitate identification by employees authorized to work thereon.

Order 1207. Tree Trimming.

When trees exist near line conductors operating at voltages exceeding 300, they shall be so trimmed that neither the movement of the trees nor the swinging or increased sagging of conductors in wind or ice storms or at high temperatures will bring about contact between the conductors and the trees, or clearance shall be secured by increasing heights of poles or by other means.

Exception: When conductors operate at voltages less than 7500, where trimming is difficult, the conductor may be protected against grounding through the tree and against abrasion by interposing between it and the tree sufficiently non-absorptive and substantial insulating, tubing or strip, or the use of tree wire.

SECTION 121. GENERAL REQUIREMENTS FOR POLE LINES

Order 1210. Compliance with other Orders and Special Precautions.

(a) Other Orders.

(1) The orders of this section apply to all pole lines whether or not they are required by section 123 to have a definite grade of construction. The additional requirements for supply lines in those situations which are required to have a definite grade of construction, A, B, or C, will be found in section 125, 126 and 127. Orders 1211, 1212 1213 and 1217 apply also to signal lines whether or not they are required by section 123 to have a definite grade of construction.

(2) The clearance and separations of conductors, climbing space, vertical wiring on all poles and clearances from other structures shall comply with the requirements of section 122.

(b) **Special Precautions.**

Where conductors are attached to structure other than those used solely or principally for supporting lines, all rules shall be complied with insofar as they apply, and such additional precautions as may be deemed necessary shall be taken to avoid injury to such structures or to the persons using them.

Order 1211. Location of Poles and Towers.

(a) Clearance from Hydrants.

Poles, towers and other supporting structures and their guys and braces shall be so located as to provide horizontal clearances from them to the nearest point of hydrants and signal pedestals of not less than 3 feet and to street edge of curb (unless structures are suitably protected from traffic) of not less than 6 inches.

(b) **Guards.**

Where necessary, poles and towers exposed to abrasion or other damage which would materially affect the strength of the support, shall be protected by guards.

(c) **Clearance from Rail.**

Where railway tracks are paralleled by overhead lines, the poles shall, if practicable, be located not less than 12 feet from the nearest track rail, except that at sidings a clearance of not less than 7 feet is allowed. At loading sidings sufficient space must be left for a driveway.

(d) **Protection from Fires.**

Poles and towers shall be so placed, guarded and maintained as to be exposed as little as practicable to brush, grass, rubbish or building fires.

Order 1212. Guys and Anchors.

(a) **When Required.**

When the mechanical loads to be imposed on poles, towers or other supporting structures are greater than can be safely supported by the poles or towers alone, additional strength shall be provided by the use of guys, braces, or other suitable construction.

(b) **Angles and Dead Ends.**

Guys shall be used when necessary to balance conductor stresses, as at corners, angles, dead ends, and changes of grade of construction.

(c) **Guys and Total Load.**

When guys are used with wood or other poles or towers capable of considerable deflection before failure they shall be able to support the entire stress in the direction in which they act, the pole acting simply as a strut. The guy shall be attached to the structure as near as practicable to the center of the conductor load to be sustained.

(d) **Guy Fastenings.**

Guy wires shall be stranded and where attached to anchor rods shall be protected by suitable guy thimbles or equivalent. Cedar and other soft-wood poles to which any guy having a strength of 10,000 pounds or more is attached, shall be protected by the use of suitable guy shims, and in this case guy hooks or other suitable means shall be provided to prevent the guys from slipping along the poles. Guy hooks or equivalent shall also be used wherever the horizontal distance from anchor to pole is less than two-thirds the vertical distance from the ground line to the point of attachment.

(e) **Guy Insulation.**

Guys attached to metal poles or structures shall be insulated from them by suitable blocking, when liable to be subjected to electrolysis of the anchors, unless insulators are placed in the guys themselves.

(f) **Anchor Rods.**

Anchor rods shall be so installed as to be in line with the pull of the attached guy when under load, except when installed in rock or concrete.

Order 1213. Insulators or Mechanical Guards for Guy and Span Wires.

(a) **Where Required.**

Each guy wire or guy cable attached to any pole or structure carrying supply conductors of more than 300 volts to ground, and not more than 15,000 volts, or where exposed to such voltage by other lines shall be equipped with one or more effective insulators located not less than 8 feet above the ground, and at such a point that if the guy wire breaks at or below the insulator, or a supply conductor falls upon it, the part above the insulator can not be reached by pedestrians.

Exception: The placing of an insulator in a guy wire or guy cable will not be required where the guy wire or guy cable is electrically connected to grounded steel structures or to a ground connection on wooden poles.

Where guys are uniformly permanently grounded throughout any system of overhead lines, strain insulators will not be required.

(b) **Two Insulators.**

When the guy wire to any pole carrying supply or signal conductors, or both, is carried above or under overhead supply conductors of more than 300 volts to ground, two or more insulators shall, where hazard would otherwise exist, be used so that so far as possible the exposed section of the guy wire shall be between two insulators. Neither insulator shall be within 8 feet from the ground.

(c) **Grounding of Guys.**

The anchored end of the guy wires attached to wood poles carrying lines of more than 15,000 volts shall, except in rural districts, be permanently and effectively grounded wherever this part of the guy has a clearance of less than 8 feet to ground.

Exception: If an insulator is used which is permanently effective against the highest voltage which is liable to be impressed upon it, the above requirement as to grounding need not be met.

(d) **Location of Insulators.**

Where guys in which it is necessary to install insulators are so arranged that one crosses or is above the other, insulators shall be so placed that in case any guy sags down upon another the insulators will not become ineffective.

(e) **Strength.**

Guy insulators shall have a mechanical strength at least equal to that of the guys in which they are installed.

(f) **Span Wire Insulators.**

All span wires, including bracket span wires shall have two suitable insulators inserted between each point of support of the span wire and the lamp or trolley contact conductor supported.

Exception: (1) Single insulation is permitted in trolley span wire or bracket when supported on wooden poles supporting only trolley, railway feeders or signal conductors used in the operation of the railway concerned or on wooden poles supporting other conductors when the insulator used is permanently effective against the highest voltage which is liable to be impressed upon it.

(2) This order does not apply to insulated feeder taps used also as span wires.

(3) If an insulated hanger is used, such insulated hanger may be considered as one of the required insulators.

(g) **Insulators in Suspension Ropes.**

Effective insulators shall be inserted at least 8 feet from the ground or grounded surface in metallic suspension ropes or chains supporting lighting units.

(h) **Mechanical Guards.**

The earth end of all guy wires or cables attached to buried anchors where exposed to traffic shall be provided with a substantial and conspicuous wood or metal guard not less than 8 feet long.

Order 1214. Transformers, Regulators, Lightning Arresters, Switches and Similar Equipment on Supply Lines.

(a) **Location on Pole.**

Transformers, regulators, lightning arresters, switches and similar equipment when located below conductors or other attachments shall be mounted outside of the climbing space. On buckarm poles the climbing space and the lateral working spaces parallel to either the line arms or the buckarms shall be kept clear, if practicable.

(b) **Guarding.**

Current-carrying parts of switches, automatic circuit breakers and lightning arresters, if of more than 300 volts and located on the climbing side of the pole, shall be enclosed or suitably guarded if less than 20 inches from the pole center, except when located on or above the top crossarm. The spacing between transformers and similar equipment of supply lines, and signal equipment including conductors shall not be less than is required for the spacing between supply conductors and signal conductors in similar situations.

(c) **Working Space.**

All current-carrying parts of switches, fuses, lightning arresters, also transformer connections and other connections which may require operation or adjustment while alive and are exposed at such times, shall be so arranged that in their adjustment while alive, the hand need not be brought nearer to any other current-carrying part at a different voltage than the clearance from pole surfaces required in table V order 1221 for conductors of corresponding voltages.

Order 1215. Branch Connections.

(a) **Accessibility.**

Connections of branches in supply circuits, service loops, and equipment in overhead construction shall be readily accessible to authorized employees. When possible, connections shall be made at poles or other structures.

(b) **Clearances.**

Such connections shall be so supported and spaced that swinging or sagging can not bring them in contact with other conductors or interfere with the safe use of pole steps, or reduce the climbing or lateral working space.

Order 1216. Lamps.

(a) **Location.**

All exposed metal parts of lamps and all such parts of their supports unless effectively insulated from the parts carrying current shall be maintained not less than 20 inches from surfaces of pole structures if of wood and maintained at a suitable height above roadways and footways.

Exception: Lamps at pole tops may have less clearance than the above.

(b) Material of Suspension.

The lowering rope or chain for lighting units arranged to be lowered for examination or maintenance shall be of a material and strength designed to withstand climatic conditions and to safely sustain the lighting unit. The lowering rope or chain, its supports, and fastenings shall be examined periodically.

Order 1217. Poles and Crossarms.

a) Poles.

Poles used for lines for which no designated grade is required shall be of such initial size, and where necessary so guyed or braced as to safely withstand the loads to which they may be subjected, including linemen working on them.

(b) Crossarm Bracing.

Crossarms shall be securely supported, by bracing, if necessary so as to safely support loads to which they may be subjected in use, including linemen working on them. Any crossarm or buckarm except the top one shall be capable of supporting a vertical load of 225 pounds at either extremity in addition to the weight of the conductors.

(c) Location of Crossarms.

In general, crossarms shall be maintained at right angles to the axis of the poles and to the direction of the attached conductors, and at crossovers shall be attached to that face of the structure away from the crossing, unless special bracing or double crossarms are used. The Wisconsin statutes require double crossarms at all steam railroad crossings.

(d) Pole Setting.

Wooden poles set in earth shall be set in a manner which will give the poles sufficient stability to safely carry the loads which may be placed upon them.

(e) Pole Identification.

(1) Each utility owning in whole or in part poles, towers, or frames for supporting supply or signal circuits shall mark each such pole or structure with the initials of its name, abbreviation of its name, corporate symbol or other distinguishing mark by which the ownership of such structure can be determined readily and definitely.

Exceptions:

(1) In case of a double line of structures such as one carrying or supporting overhead trolley wires or fixture construction where the ownership is vested in one utility, marks need be affixed to but one structure of each pair.

(2) Where only one type of utility rendering one kind of service owns poles, etc., in a community, exclusively owned poles, etc., need not be marked except at division of ownership points where adjacent poles shall be marked.

(3) Where more than one utility furnishes the same kind of service in rural communities only every fifth exclusively owned pole, etc., need be marked. At division of ownership adjacent poles shall be marked.

(4) This rule need not apply to rural, mutual or roadway telephone companies except that poles, etc., jointly owned, shall be marked.

(5) None of the above exceptions apply to poles located at railway crossing. Poles used at railway crossings shall always be marked.

(2) The identification marks shall be made with paint, stamp metal tags, brands, or other effective means. The marks shall be of such size and so spaced and maintained as to be easily readable from the ground.

(3) In the case of two or more utilities jointly owning any such structures, the distinguishing mark of each utility shall be placed thereon.

Order 1218. Conductors.

(a) Material.

All supply conductors shall be of copper, aluminum (with or without steel reinforcements), copper-covered steel, or other material which will not corrode excessively under the prevailing conditions. If of iron or steel and not copper-covered, conductors shall be galvanized.

(b) **Minimum Size.**

Supply line conductors in urban districts shall be not smaller than listed in the following table:

TABLE I. MINIMUM SIZES OF SUPPLY CONDUCTORS (URBAN DISTRICTS)

Soft Copper	No. 6 A. W. G.
Hard or Medium Drawn Copper	No. 8 A. W. G.
Steel	No. 9 Stl. W. G.

Stranded Aluminum	Spans 150 Feet or Less	Spans Over 150 feet
Not reinforced	No. 1 A. W. G.	No. 0 A. W. G.
Steel reinforced	No. 6 A. W. G.	No. 4 A. W. G.

(c) **Protection.**

All supply conductors in urban districts operating at less than 3000 volts to ground shall, when installed, have standard weather-proof covering or its equivalent.

Order 1219. **Minimum Sizes and Sags of Service Leads.**

(a) **More than 750 Volts.**

Supply service leads of more than 750 volts to ground shall comply, as to sizes and sags, with the requirements for supply line conductors of the same voltage.

(b) **750 Volts or Less.**

(1) Supply service leads of 750 volts or less in spans not exceeding 150 feet shall be not smaller than the sizes listed in the table below. Such leads shall have sags not less than 12 inches for spans 100 feet or less, 18 inches for spans up to 125 feet and 27 inches for spans up to 150 feet.

TABLE II. MINIMUM SIZES OF SERVICE LEADS OF NOT MORE THAN 750 VOLTS

Situation	Span 150 Feet or Less
Alone	No. 10 if soft copper
Concerned with signal lines	No. 12 if medium or hard copper
Over supply lines of less than 750 volts	No. 12 if steel
Over trolley of less than 750 volts	No. 8 if soft copper
Over any trolley in rural districts	No. 10 if medium or hard copper
Over supply lines of 750 to 7500 volts	No. 12 if steel.
Over supply lines of more than 7500 volts in rural districts	No. 6 if soft copper
Over trolley of more than 750 volts in urban districts	No. 8 if medium or hard copper
Over supply lines of more than 7500 volts in urban districts	No. 9 if steel. —Grade C requirements

(2) Supply service leads of 750 volts or less in spans exceeding 150 feet shall be not smaller than required for grade C in Table IX order 1246 and shall have sags not less than required for grade C in the sag tables of Appendix A.

(c) **Cabled Service Leads.**

In lieu of separate conductors supply service leads may be grouped together in a cable, no individual conductor of which shall be of less size than permitted for separate conductors. The sags shall be the same as required above; for the individual conductors where carried separately.

SECTION 122. CLEARANCE AND SEPARATION OF WIRES

Order 1220. Clearances of Conductors and Wires at Crossings.

(a) **Heights of Wires.**

The clear space between the lowest overhead line conductor, guy, messenger, arc or trolley span wire or lightning protection wire and the surface of rails, streets, highways, alleys or generally accessible spaces across or above which the former pass, shall not be less than that given in the following table at 60 deg. F. with no wind, where the conductor or wire has fixed supports and the span does not exceed 150 feet.

TABLE III. CLEARANCES FROM RAILS, STREETS, HIGHWAYS, ETC.

The numbers represent the clearances in feet to be provided by the conductors or wires of classes specified at the heads of columns, above places specified at the side of the table.

Nature of Crossing	Signal Conductors, Messengers, Guys, Spans, Lightning Protection Wires, and Supply Lines and Services Less Than 300 Volts to Ground Feet	All Conductors Operating at Voltages from 300 Volts to Ground up to 15,000 Volts Between Conductors Feet	All Conductors Operating at Voltages from 15,000 to 50,000 Volts Between Conductors Feet	Trolley Contact Conductors (not feeder cables) Feet
Crossing above track rails of steam railroads	(1) 27	(1) 28	30	22
Along streets or alleys in urban districts over track rails not included above	(2) 18	20	22	(3) 16
Crossing streets or roads in urban or rural districts	24	24	24	24
Along the roads in rural districts	(2) 15	18	20	(3) 16
Crossing above spaces or ways accessible to pedestrians	(4) 14	15	17	(3) 16

(Reference numbers refer to exceptions and additions below.)

Exceptions and Additions to Table III.

(1) This clearance may be reduced to 25 feet when paralleled by trolley contact conductors on same street or highway.

(2) This does not apply to guys which are not carried over, but merely beside, streets or alleys unless also over driveways. Over roadways to residence garages 10 feet is sufficient clearance.

(3) This clearance is the minimum clear height in the middle of the trolley contact conductor span and the point of support at the trolley hanger should be at a height not less than 2 feet in addition to this minimum, thus allowing 2 feet for the total maximum sag at 60 deg. F. in span wire and trolley contact conductor.

For trolley contact conductors of more than 750 volts to ground this clearance shall be increased by 2 feet.

(4) For guys 8 feet will be sufficient and no clearance is required for anchor guys not passing across pathways, or for those parallel with sidewalk curbs where traffic guards are provided.

(b) **Increased Clearances.**

(1) For spans exceeding 150 feet clearances shall be increased by 1 inch for each 10 feet of the excess between 150 and 300 feet and by 1 inch for each 20 feet of the excess beyond 300 feet.

(2) For voltages over 50,000 the clearances given shall be increased at the rate of one-half inch for each 1000 volts of the excess.

(3) Where the lowest supply conductor at a crossing over track rails is supported by suspension insulators the initial clearance shall be sufficient prevent the minimum clearances over rails given in table above from being duced more than 10% through the breaking of a conductor in either adjoi span.

(4) Provisions for increased clearances are cumulative when more than applies.

(c) **Conductors and Wires Crossing Others. Clearances** at Wire Crossin

The clear space between the lowest overhead line conductor or wire a any other conductor or wire over which the former crosses (except for cr ings between conductors and guy wires or span wires on the same poles which see Table V order 1221) shall not be less than that given in the follow table at 60 deg. F. with no wind where the upper conductor or wire has supports and the sum of the distances from the point of intersection to nearer supporting structure of each span does not exceed 100 feet.

TABLE IV. WIRE CROSSING CLEARANCES IN FEET

Conductors Crossed Over	Conductors Crossing Over: Signal conductors	Conductors operating at 0 to 750 volts	Service operating at less than 750 volts	Conductors operating at 750 to 7,500 volts	Conductors operating at 7,500 to 50,000 volts	Guys, messengers, span wires, light
Signal including their cables and messengers	2	(2) 4	2	4	6	
Conductors operating at 0 to 750 volts	4	2	2	2	4	
Conductors operating at 750 to 7,500 volts	4	2	4	2	4	
Conductors operating at 7,500 to 50,000 volts	6	4	6	4	4	
Trolley contact conductors and associated feeders	(3) 4	(3)(4) 4	4	6	6	
Guys, messengers, span wires, lightning protection wires service loops	2	2	2	4	4	

Note: (1) Reference number refer to exceptions and additions below.

An asterisk before a clearance indicates that lines operating at the ages stipulated at the top of the column in which the clearance in que appears should not cross over the type of lines indicated in the hor heading for this clearance.

Exceptions and Additions to Table V.

(1) Completely insulated sections of guys to supporting structures ha no conductors operating at voltages higher than 7500 may have less than clearance from each other.

A clearance of 2 feet will be permitted where the supply conduct above the signal conductor provided the crossing is not within 6 feet from pole concerned in the crossing and the voltage to ground does not exceed volts.

(3) Trolley contact conductors above 750 volts should have at least 6 clearance. This clearance should also be provided over lower voltage trol contact conductors unless the crossover conductors are beyond reach of trolley pole leaving the trolley contact conductor or are suitably protect against damage from trolley poles leaving the trolley contact conductor.

(4) Troley feeders are exempt from this clearance requirement if th are at the same nominal potential and of the same system.

(d) Increase Clearances.

(1) Where the sum of the distances from the nearest supporting str tures of two spans concerned to their point of crossing exceeds 100 fee clearances shall be increased by 2 inches for each 10 feet of the exces tween 100 and 200 feet and by 2 inches for each 20 feet of the excess be 200 feet.

(2) For voltages over 50,000 the clearances shall be increased at the of one-half inch for each 1000 volts of the excess.

(3) Where the upper line at a crossing between two lines is supported suspension insulators, the clearances above lines crossed shall be incre sufficiently above those given in the preceding table to prevent the cleara from being reduced by the breaking of a conductor in either adjoining by more than 20 per cent below the specified clearance.

(4) The above increases are cumulative when more than one applies.

Order 1221. **Minimum Values of Line Conductor Clearances** and Horizon **Separation at the Supports.**

(a) **Clearances and Separations.**

At any fixed support the clearances of line conductors from their supp ing structures and attachments thereto (except insulators to which any ductor is attached), and the horizontal separation between any two line ductors, shall not be less than the values given in the following table: requirements of order 1222 apply if they give a greater separation than order.)

Exception: (1) Clearances between individual wires or cables supp by the same messenger or between any group and its supporting messenger not subject to the provisions of this rule.

(2) The clearances or separations stated may be measured from the cen of the supporting insulator instead of from the conductor itself.

(3) Cables, duplex, triplex, and twisted pair conductors, supported on sulators or messengers, whether single or grouped, may be considered sin conductors even though they may contain individual conductors not of same phase or polarity.

TABLE V. MINIMUM LINE CONDUCTOR CLEARANCES AND SEPARATI AT SUPPORTS

Applying to conductors of the same circuit or of different circuits.

Classification Concerned	Horizontal Separation Between Conductors Not of the Same Phase or Polarity Inches	Clearance From Span and Guy Wires Attached to the Same Pole or From Vertical or Lateral Conductors of Other Circuits Inches	Clearance From Surfa of Poles or Crossarms or From Vertical or Lateral Conductors of the Sa Circuit Inches
Signal	(1) 1	3	(2
Direct current railway feeders No. 4-0 or larger, 0-750 volts	6	(3) 6	
Railway feeders 750-7,500 volts and direct current railways below No. 4-0, 0-750 volts	(4) 12	(3) (5) 6	
Supply conductors 0-7,500 volts	(6) (4) 12	(3) (5) 6	
For all conductors above 7,500 volts add for each kv. over 7,500 volts	0.4	(5) 0.4	

(Reference numbers refer to exceptions and additions below.)

Exceptions and additions to Table V.

(1) The preferable minimum separation is 6 inches, but where cross having less pin spacing than this have been in regular use a separation inches will be permitted. This requirement does not apply at points of position of signal line conductors.

(2) Signal conductors may be attached to supports on the sides or toms of crossarms or on the surfaces of poles if at least 4 feet from any ply line operating at less than 7500 volts and at least 6 feet from any line operating at voltages exceeding 7500 volts carried on the same structure.

(3) Where a trolley feeder, supply line or signal line is supported by span wire concerned this clearance is not required.

(4) Where a separation of 10 inches to 12 inches has already been lished by practice for spans having apparent sags of not over 3 feet and erating at voltages not exceeding 7500 the minimum separation may be tinued subject to the provisions of order 1222.

(5) Clearances from these conductors to guy, span, messenger or ning protecting wires run in the direction of the line shall not be less than separation required between two-line conductors of the voltage concerned

(6) Where conductors operating at less than 750 volts all of one are supported on vertical racks in spans averaging not to exceed minimum separation of 12 inches may be reduced to one-third of the given and applied for vertical clearance.

(b) **Location of Wires.**

Supply lines of any one voltage classification may be maintained same crossarm with the supply lines of the next consecutive classificati der any one of the following conditions:

(1) If they occupy pin positions on opposite sides of the pole.

(2) If in bridge-arm construction they are separated by a distance of less than the climbing space required for the higher voltage concerne provided for in order 1225.

(3) If the higher voltage conductors occupy the outer pin positions the lower voltage conductors the inner pin positions.

(4) If series lighting or similar circuits, which are ordinarily dead periods of work on or above the crossarm concerned, occupy the inne position and the lower voltage conductors occupy the outer pin positi

(5) If the two lines concerned are signal lines used in the operati supply lines and supply lines of less than 7500 volts and are owned by same utility, provided they are installed as in (1) or (2) above.

Order 1222. Required Line Conductor Clearances and Separations at the Su **ports.**

(a) **Line Conductor Separations According to the Sags.**

(1) The separation at the supports of the conductors of the same or ferent circuits shall in no case be less than the values given in the follow tables at 60 deg. F. with no wind.

(2) The requirements of Table V shall apply if they give a greater aration than this.

TABLE VI. SEPARATION IN INCHES FOR CONDUCTORS SMALLER THAN NO. 2 A. W. G.

Separation for Sags Shown

Voltage	36	48	72	96	120	180
750	12.0	17.0	24.0	29	34	43
2,200	12.5	17.5	24.5	30	35	44
6,600	13.5	18.5	25.5	31	36	45
22,000	....	21.5	28.5	34	39	48
44,000	....	....	33.0	38	43	53
66,000	....	....	37.0	43	47	57

TABLE VII. SEPARATION IN INCHES FOR LINE CONDUCTORS NO. 2 A. W. G. OR LARGER.

Sag in Inches

Voltage	36	48	72	96	120
750	12.0	14.0	17.0	20	22
2,200	12.5	14.5	17.5	21	23
6,600	13.5	15.5	18.5	21	24
22,000	....	18.5	21.5	24	27
44,000	....	....	....	29	31
66,000	....	....	....	..	36

(b) **Increased Line Conductor Separations and Clearances at the** Suppor **if Suspension Insulators are used.**

(1) Where suspension insulators are used and are not restrain **movement, the values of conductor separations required by** Table VIII or **1223 or by (a) above shall be increased by one-half the length** of the **pension insulator string.**

(2) Where suspension insulators are used and are not restrain **movement the conductor clearance from surfaces of supports,** from span **guy wires, or from vertical or lateral conductors shall be such** that the va **of clearances required by Table V order 1221 will be maintained** with an **sulator swing of 45 deg. from the vertical position.**

Order 1223. Minimum Lateral Working Space and Vertical Separation be **tween Conductors at Different Levels.**

(a) **Height of Working Space.**

The lateral working space between supply conductors and between **ply and signal conductors at different levels shall have** an approximate vert **height of not less than given in Table 8 of this order** with a minim **of 2 feet.**

(b) **Width of Working Space.**

This space on the climbing side of the pole extends laterally from ea **side of the climbing space to the outer pin position** of the arm and with [illegible] horizontal width from the face of the crossarm equal to the width of the climbing space required for the highest voltage conductors concerned.

[illegible] Freedom from Obstruction.

No vertical or lateral conductors shall obstruct this working space. Such conductors, if not on the opposite side of the pole from the climbing side, must [illegible] as far from the crossarm as the width of the climbing space re[illegible] for the highest voltage conductors concerned.

[illegible] Only One Buck Arm.

[illegible] buck arms obstruct the lateral working space between line con[illegible] not more than one single or double buck arm shall be placed on any [illegible] less the voltage of all conductors concerned on the buck arms and ad[illegible] crossarms above and below does not exceed 750, or unless the lateral [illegible] space required by Table VIII of this order is provided between the [illegible] attached to the buck arm and the conductors on the adjacent line [illegible] which the conductors on the buck arm are not connected.

[illegible] Minimum Vertical Separations Between Conductors on the Same Structures but on Different Crossarms.

[illegible] vertical separations between conductors of the same or different [illegible] classification when carried on the same structure but on different [illegible] shall not be less than the values given in Table VIII of this order.

Exception: (1) The provisions of this order do not apply to the vertical spacings between lines at different levels where men are not permitted to enter [illegible] while the lines are alive.

[illegible] Trolley contact conductors and their associated feeders, which for [illegible] are carried at approximately the same level, may be carried at [illegible] below signal lines if at least 4 feet below signal lines for public use and [illegible] below signal lines used only in the operation of supply lines.

[illegible] VIII. MINIMUM VERTICAL SEPARATIONS IN FEET BETWEEN [illegible] CONDUCTORS OF THE SAME OR DIFFERENT VOLTAGE CLASSIFICATION WHEN CARRIED ON THE SAME STRUCTURE BUT ON DIFFERENT CROSSARMS

Supply Conductors at Higher Levels

[illegible] at Lower Levels	0 to 750 Volts Feet	750 to 7,500 Volts (1) Feet	7,500 to 15,000 Volts (1) Feet	Different Utilities 15,000 to 50,000 Volts Feet	Same Utility 15,000 to 50,000 Volts Feet
[illegible] lines	(3) 4	4	6	6	....
[illegible] Lines used in operation of supply lines	2	(2) 2	4	6	4
[illegible] volts	2	2	4	6	4
[illegible] 7,500 volts	....	2	4	6	4
[illegible] to $15,000 volts	....	....	2	4	4

(Reference numbers refer to exceptions and additions to table.)

Exceptions and Additions to Table VIII

The specified clearances usually indicate the minimum vertical separation between parallel crossarms (center to center) at the pole, and where these clearances are provided between the centers of the crossarms the clearance of [illegible] conductors supported thereon may be reduced below those given in the [illegible] by an amount not to exceed 8 inches where the tabular clearance is 2 [illegible] or 4 feet, and by an amount not to exceed 12 inches when the tabular clearance is 6 feet.

The provisions of this order do not apply to the vertical spacing between conductors at different levels where men are not permitted to enter the spaces while the lines are alive.

[illegible] Where conductors are operated by different utilities a minimum vertical spacing between the respective conductor levels of 4 feet is recom[illegible]

[illegible] shall be increased to 4 feet when the signal conductors are car[illegible] supply conductors unless the signal line conductor size is that re[illegible] for grade C supply lines.

In localities where the practice has been established of placing on [illegible] poles, crossarms carrying supply circuits operating at less than [illegible] to ground and crossarms carrying signal circuits at a vertical sep[illegible] less than that specified in the table, such existing construction (pro[illegible] the minimum separation between the crossarms is not less than 2 feet) [illegible] continued until the said poles are replaced; provided however, that [illegible] to existing construction shall conform to the clearance require[illegible] specified in the above table.

When signal wires are all in cable a supply crossarm carrying only wires [illegible] at not exceeding 300 volts to ground may be placed at not less than [illegible] above the point of attachment of the cable to the pole; provided that [illegible] nearest supply wire on such crossarm shall be at least 30 inches hori[illegible] from the center of the pole and the cable be so placed as not to ob[illegible] the climbing space.

[illegible] Vertical Arrangement of Conductors.

Supply conductors of the same circuit arranged vertically on separate [illegible] may occupy the same crossarms with supply conductors of the next [illegible] voltage classification similarly arranged, provided the clearance [illegible] climbing space specified for the higher voltage are maintained at each [illegible] concerned. When so arranged, the minimum vertical separation between crossarms shall be that required in Table VIII of this order for the highest [illegible] concerned.

[illegible] Vertical Racks.

[illegible] for circuits of less than 750 volts may be carried on vertical [illegible] at one side of the pole where normal spans do not exceed 150 feet [illegible] full width of climbing space is maintained past the rack and at least [illegible] above and below.

Order 1224. Conductors of Different Sags on the Same Supports.

(a) Variation In Clearance.

Line conductors supported at different levels on the same structure and [illegible] to different sags shall have vertical spacings at the supporting structure [illegible] adjusted that the minimum spacing at any point in the span, at 60 deg. F. [illegible] no wind, shall not be reduced more than 25 per cent from that provided [illegible] by orders 1221-1222, and 1223 at the supports.

(b) Readjustment of Sags.

Sags shall be readjusted when necessary to accomplish the foregoing but [illegible] sufficiently to conflict with the requirements of order 1246.

Order 1225. Climbing Space.

[illegible] Lines Alone or on Joint Poles with Signal Lines.

[illegible] carrying crossarms supporting supply lines alone [illegible] or joint poles shall be arranged and maintained so [illegible] vertical climbing space on at least one side or [illegible] of the pole or structure having dimensions horizontally each way as [illegible]

[illegible] supply conductors alone of less than 300 volts to ground the [illegible] less than 24 inches.

[illegible] conductors alone of more than 300 volts to ground the [illegible] not less than 30 inches.

[illegible] of voltages between 7500 and 15,000 volts are worked on [illegible] when alive a climbing space of at least 36 inches hori[illegible] way shall be provided.

[illegible] signal conductors on the same pole and below supply conduct[illegible] climbing space shall be provided through the signal conductors [illegible] for the supply conductors immediately above.

[illegible] signal conductors on the same pole and above supply conductors [illegible] 7500 volts the climbing space required for the supply conductors [illegible] up to a point at least 4 feet above the highest supply conductors [illegible] the pole. If the supply conductors exceed 7500 volts this distance [illegible]

Exceptions: (1) Where Men do not Ascend Beyond Conductors.

[illegible] above provisions do not apply if the unvarying practice and pub[illegible] rules of the employers concerned prohibit employees from [illegible] beyond the conductors of the given line unless the lines are killed [illegible] suitable shields. In such cases if the conductors operate at [illegible] volts, a 24-inch climbing space is permitted.

[illegible] Protected Vertical Conductors.

[illegible] runs incased in suitable conduit or other protective covering (See [illegible] and securely attached to the surface of the pole or structure and [illegible] structure itself when included in one side or corner of this space [illegible] reverse arm construction is used are not considered to obstruct [illegible]

[illegible] Protected Longitudinal Runs.

[illegible] runs of cable or conductors are not considered to obstruct [illegible] if no supply line conductors carried on crossarms are with[illegible] or below (See also Note (8) Table VIII order 1223). Such [illegible] must be protected when within 20 inches from pole cen[illegible] guard arms securely fastened to the pole, or by substantial [illegible] unless located above supply line conductors or at least [illegible] grounded metal sheathed cables are uninsulated from metal [illegible] poles, similar protection shall be provided for such [illegible] 24 inches from the pole center.

[illegible] Clearance for Longitudinal Runs.

[illegible] runs of supply conductors not over 750 volts [illegible] surface of the pole as by brackets or racks or on pins [illegible] they are located at levels at least 4 feet above or be[illegible] carried on crossarms, sufficient side clearance [illegible] be provided for the line conductors on the adjacent [illegible] width climbing space for at least 4 feet above [illegible] runs concerned.

[illegible]

[illegible] as free as practicable from posters, bills, tacks, [illegible] obstructions. Through bolts shall be properly [illegible]

Order 1226. Clearances of Vertical and Lateral Conductors.

Exception: [illegible] and (d) do not apply to portions of a pole [illegible] while the conductors in question are alive.

[illegible] Climbing and Working Spaces.

[illegible] ground wires and metal sheathed calbes [illegible] the vertical climbing spaces or the lateral working space [illegible] conductors at different levels or interfere with the safe use of [illegible] where such are installed.

(b) Clearances Between Conductors and from Conductors to Surfaces of Structure.

[illegible] lateral conductors which are rigidly supported on fixed sup[illegible] the minimum separations and clearances from other con[illegible] pole surfaces and guy, span or messenger wires provided [illegible] supported greater separations and clearances shall be [illegible] and see below for exceptions).

[illegible] of supports and from other conductors of the same cir[illegible] volts or less, plus .25 inch for each 100 volts over 7500 [illegible] concerned should be used as basis for calculation. [illegible] under note 2 table 5 order 1221).

[illegible] or messenger wires and from conductors of other [illegible] inch per kilovolt (highest voltage concerned), in [illegible] for supply conductors and 3 inches for signal conductors. [illegible] other supports as provided in order 1227.

[illegible] Supply Conductors Through Signal Conductors.

[illegible] including ground wires which are carried through [illegible] shall be inclosed in insulating conduit or in [illegible] protected by an insulating covering or wooden mould[illegible] shall extend from a point at least 6 feet below the lowest [illegible] point at least 6 feet above the highest signal conductor [illegible] supply voltage exceeds 7500 volts or to a point at least [illegible] signal conductor or equipment if the supply voltage [illegible]

[illegible] the distance above the highest signal conductor or [illegible] to 2 feet if the supply voltage is less than 300 volts [illegible] established as the vertical clearance.

[illegible] and lateral conductors of street lighting circuits [illegible] than 750 volts may be run on the street side of the [illegible] cable having no suitable substantial insulating cover[illegible] taut on standard insulators supported on pins or brackets [illegible] that the cable shall be held at a distance of ap[illegible] from the surface of the pole and from any pole [illegible]

(d) Vertical Conductors Through Supply Conductors.

[illegible] not more than 7500 volts shall clear the pole cen[illegible] by not less than 15 inches for a distance of not less than 4 feet above [illegible] supply line conductors which are of not more than 7500 [illegible] when the latter are carried on or within 4 feet of the pole. If the ver[illegible] conductors are of more than 7500 volts this clearance shall not be less than 20 inches. If the supply line conductors are of more than 7500 volts the clearance from pole center shall apply for a distance not less than 6 feet above and below.

Exception: (1) Vertical and lateral supply conductors, including ground wires which are enclosed in insulated conduit or in metal conduit or cable having an insulating covering, or wooden moulding if wire is used having triple braid weatherproof insulation, whenever within 4 feet from open supply lines of less than 7500 volts or within 6 feet from open supply lines of more than 7500 volts may have less than the clearance specified above.

(2) Vertical and lateral conductors in metal sheathed cables and ground wires when installed on poles used only for supply lines and employing side arm construction when the lines are carried only on one side of the poles may have the insulating conduit or covering omitted.

(3) Vertical and lateral conductors of less than 7500 volts when on poles used only for supply lines may be run on the street side of the pole in multiple-conductor cable having suitable substantial insulating covering if such cable is held taut on standard insulators supported on pins or brackets and so arranged that the cable shall be held at a distance of approximately 5 inches from the surface of the pole or any pole step.

(4) Vertical and lateral signal conductors may be attached directly to the pole by means of rings, knobs or brackets provided they are rubber insulated twisted pairs and do not come within 4 feet from open supply lines of less than 7500 volts or within 6 ft. of open supply lines of more than 7500 volts. If distances are less than the above the conductors shall be incased in insulating conduit or in other substantial insulating and protective covering.

(e) Mechanical Protection near Ground.

Where within 8 feet of the ground a suitable mechanical protective covering shall be provided over all vertical conductors, including lead sheathed cables. The protective covering shall be of wood moulding or other insulating material if for the ground wire of a lightning arrester.

Exception: The covering may be omitted for cables and for ground wires having a triple braided weatherproof insulation in rural districts and for cables armored or installed in grounded metal conduit in urban districts.

(f) Conductors not in Conduit.

Conductors not incased in conduits shall have the same clearance from conduits as from other surfaces of structures.

Order 1227. Clearances of Conductors of One Line from Poles and Conductors of Another Line.

(a) Clearances from Poles.

Where conductors of one line are carried within 6 feet from a supporting structure of a second line, and are not attached thereto, the clearance between the conductors of the first line and any part of the supporting structure of the second line, shall if practicable be not less than 3 feet at 60 deg. F. and no wind. In no case should this clearance be less than the values required by orders 1221, and 1222 for separation between similar conductors on the same support, increased by 1 inch for each 2 feet of the distance from the supporting structure of the second line to the nearest supporting structure of the first line. The climbing space on the structure of the second line shall in no case be reduced by a conductor of the first line.

(b) Clearances from Conductors.

The clearance in any direction, at 60 deg. F. with no wind, of any conductor of one line from any conductor of a second and conflicting line shall not be less than required by orders 1221 and 1222 for separation between conductors on the same support and shall not be less than 4 feet.

It shall be at least equal to the apparent sag of the conductor having the greater sag plus .2 inch for every 1000 volts of the highest voltage concerned.

Order 1228. Clearances from Buildings.

(a) General.

Conductors shall be so arranged and maintained as to hamper and endanger firemen as little as possible in the performance of their duties.

(b) Ladder Space.

Where buildings exceed 3 stories or 50 feet in height overhead lines shall be arranged where practicable so that a clear space or zone at least 6 feet wide will be left either adjacent to the building or beginning not over 8 feet from the building to facilitate the raising of ladders.

(c) Clearance of Lines of 300 to 7500 volts.

(1) Supply conductors operating at voltages between 300 volts to ground and 7500 volts (unless in grounded conduit or metal sheathed cable or otherwise rendered inaccessible) shall be so arranged that they do not come nearer than 3 feet measured horizontally from any point on the surface of a building or its attachments, or nearer than 8 feet above the top of any building or above any balcony or other platform crossed over.

(2) Where the above clearances can not be provided or where supply conductors are placed near enough to windows, verandas, fire escapes or other ordinarily accessible places to be exposed to contact of persons, the conductors shall be properly guarded by conduit, barriers or otherwise.

(d) Clearance of Lines of more than 7500 Volts.

Conductors operating at voltages exceeding 7500 volts (unless in grounded conduit or metal sheathed cable or otherwise rendered inaccessible) must be carried at such height and distance from buildings as not to interfere with firemen in event of fire. If within 25 feet of a building they must be carried at a height of not less than that of the front cornice. The height must be greater than that of the cornice as the wires come nearer to the building in accordance with the following table:

Distance of Wire From Building Feet	Elevation of Wire Above Cornice of Building Feet
	0
25	2
20	4
	6
10	8
5	9
2½	10
0	

(e) Where Attached to Buildings.

Where the permanent attachment of open suppl. conductors of any class to buildings is necessary for an entrance, conductors operating at over 300 volts to ground shall not be carried along or near the surface of the building unless they are guarded or made inaccessible and shall have separations from each other and clearances from building surfaces not less than those required by Table V of Order 1221-a for separation.

(f) Clearance over Roofs.

Line wires shall be at least eight feet, for voltages up to 15,000 and 10 feet for higher voltages, above the highest point of flat roofs over which they pass or from which they are supported and supporting structures shall be substantially constructed. A roof shall be considered flat if persons can readily walk on it.

Order 1229. Clearance from Bridges

(a) Accessible Portions.

Supply conductors operating at voltages less than 7500 (unless in grounded conduit or metal sheathed cable) shall be so arranged that they do not come within 3 feet from any readily accessible wing wall or other readily accessible portion of any bridge or its attachments. For conductors operating at voltages above 7500 (unless in grounded conduit or metal sheathed cable) the minimum clearances shall be those required by (b) and (c) below.

(b) Ordinarily Inaccessible Portions: Where Attached.

Open supply conductors passing over, under, or near a bridge (other than brick, concrete, or masonry requiring infrequent inspection or repair) when attached thereto shall where practicable be so arranged that they do not come within the following distances of any bridge or abutment.

Operating voltage	Clearance in Feet
0 to 2,500	0.5
2,500 to 5,000	1.0
5,000 to 7,500	3.0
7,500 to 15,000	5.0
15,000 to 50,000	7.5

(c) Ordinarily Inaccessible Portions: Where not Attached.

Open supply conductors passing over, under or near a bridge (other than brick, concrete, or masonry requiring infrequent inspection or repair) and not attached thereto, shall be so arranged that they do not come within the following distances from any portion of the bridge or abutment.

Operating Voltage	Clearance in Feet
Up to 7,500	3.0
7,500 to 15,000	5.0
15,000 to 25,000	7.5
25,000 to 35,000	9.0
Exceeding 35,000	12.0

(d) Separations.

Where supply conductors attached to bridges are supported at frequent intervals, their separation may be less than that specified in orders 1221 and 1222 but not less than that required by order 1221 for clearances from surfaces of poles and crossarms or less than the following:

Span Length	Separation in Inches
Up to 20 feet	6
20 to 50 feet	9

(e) Trolley Contact Conductors.

Trolley contact conductors attached to the under surface of bridges shall be provided with a substantial inverted trough of non-conducting material or other suitable means shall be taken to keep the trolley pole from making connection between the trolley contact conductor and the bridge structure.

(f) Warning Signs.

The pin-supporting structure attached to bridges shall be plainly marked with the name initials, or other identifying mark of the utility responsible for the attachment, and in addition, when the voltage of the conductors exceeds 750 volts, by the following or equivalent sign "DANGER—DO NOT TOUCH".

SECTION 123. CLASSIFICATION OF CIRCUITS ACCORDING TO GRADE OF CONSTRUCTION REQUIRED.

Order 1230. Required Grade of Overhead Line Construction and Arrangement of Levels.

(a) Various Conditions of Hazard.

(1) Supply and signal lines shall have mechanical construction of the grade designed as A, B, C, D, or E, depending upon the hazards involved, under the following conditions:

(I) When concerned in crossings or conflicts.

(II) Where carried on the same supports with other lines.

(III) In some cases where carried through urban districts.

(2) The conditions determining each grade of construction are defined in the following orders of this section.

(3) Where none of these conditions exist, no specified grade of mechanical construction is required but the general requirements given in sections 120, 121, and 122 must be met.

(4) Grades of construction A, B, and C are described in the orders of section 124. Grades of construction D and E are described in section 128. In any case where two or more of the conditions listed below exist, the grade of construction shall be the highest called for under any item applying.

(5) Where one line crosses over or conflicts with another the grade of the upper line shall not be less than the grade required for the lower line.

(b) Double Crossings.

Where a line crosses in one span over two other lines, the strength of construction shall be not less than would be required if either of the two lower lines crossed the other.

(c) Arrangement of Relative Levels.

(1) Where supply and signal lines or supply lines of different voltage classification cross each other or are in conflict, or are on the same poles or towers, the highest voltage lines shall preferably be carried at the higher levels.

(2) Where circuits of different classification are concerned in a crossing, conflict, or common use of poles, the construction for the circuit at the higher level shall be of at least as high a grade as would be required for the circuit at lower level if it were above the other.

(d) Avoidance of Conflict.

(1) Two parallel pole lines, either of which carries supply conductors, shall, where practicable, be so seperated from each other that neither conflicts with the other.

(2) If this is impracticable, then the conflicting line or lines shall be built of the grade of construction required by the orders for a conflicting line or the two lines shall be combined in a single pole line.

Order 1231. Supply Lines in Urban Districts.

(a) Grade B.

The following supply lines in urban districts shall comply with the requirements of Grade B, except as given in (b) and (c) below:

(1) Lines of more than 7500 volts.

(2) Lines of any voltage where carried above lines of more than 7500 volts.

(b) Grade C.

The following supply lines in urban districts shall comply with the requirements of Grade C, except as given in (c) below:

(1) Lines of more than 7500 volts if in cable having permanently grounded continuous metal sheath or armor and complying with the requirements of order 1274.

(2) Lines of voltages between 750 and 7500.

(3) Lines of less than 750 volts when carried above lines of voltages between 750 and 7500.

(c) No Specified Grade.

The following supply lines in urban districts need comply only with the general requirements of sections 120, 121, and 122.

(1) Lines of voltages between 750 and 7500 if in cable having permanently grounded continuous metal sheath or armor and installed in compliance with the requirements of order 1274.

(2) Supply lines of less than 750 volts where alone or concerned only with signal lines or with supply lines of less than 750 volts or both.

(3) Lines on fenced rights of way, except where crossing over, conflicting with, or higher on joint poles with the conductors of other lines.

(d) Constant-Current Circuits.

Constant-current circuits shall meet the requirements for circuits of their nominal full-load voltage.

Order 1232. Supply Lines in Rural Districts.

(a) Grade C.

(1) When either of two supply lines in rural districts, one of more than 7500 and the other of less than 750 volts, crosses, conflicts with, or has common poles with the other the upper one shall comply with the requirements of grade C, unless the line of higher voltage is in cable having permanently grounded continuous metal sheath or armor and is installed in compliance with order 1274.

(2) Constant-current circuits are included in this order, the voltage being the nominal full-lead voltage.

Exception: Supply lines of more than 7500 volts are exempted from this requirement if crossing over or conflicting only with service connections from supply lines.

(b) No Specified Grade.

(1) Supply lines of more than 7500 volts in rural districts, where alone, or where concerned only with supply lines of more than 750 volts, need comply only with the general requirements of sections 120, 121, and 122.

(2) Supply lines of less than 7500 volts in rural districts, except as covered in (a) above, need comply only with the general requirements of sections 120, 121, and 122.

Order 1233. Supply Lines Crossing Over Railways.

(a) Grade A.

Supply lines carried over railways, operated by steam, electric, or other motive power, except as provided in (b) and (c) below, shall comply with the construction requirements of grade A.

(b) Grade B.

Supply lines carried over minor tracks included in the following list shall comply with the requirements of grade B.

(1) Spurs less than 2000 feet long and not exceeding two tracks in the same span.

(2) Branches on which no regular schedule of operation is maintained.

(3) Narrow-gage tracks or other tracks on which standard rolling stock can not, for physical reasons, be operated.

(4) Tracks used only temporarily for a period not exceeding one year.

(5) Tracks not operated as a public utility, such as industrial railways used in logging, mining, etc.

(c) Street Railway Crossings.

Supply lines crossing over street railways on traveled portions of highways need conform only to general requirements, but when carried over trolley contact conductors shall have the same grade of construction as where crossing over supply lines of equal voltage.

Order 1234. Supply Lines in Crossings, Conflicts, and Joint Use of Poles With Signal Lines.

Exception. It is not intended that the requirements of rules 1234 (a-1), (b-1), and (c-1) shall apply where the signal lines concerned are individual twisted-pair drop wires only.

(a) Grade A.

Supply lines and signal lines under the conditions specified below shall comply with the requirements of grade A.

(1) Constant-potential alternating-current supply lines normally operating at more than 7500 volts between conductors of 4400 volts to neutral or ground, or constant-current circuits of more than 10 amperes, or direct-current trolley circuits of more than 750 volts to ground where at higher levels and crossing over, conflicting with, or having joint poles with signal lines except as noted in (b-3) below for certain signal conductors.

(2) Signal lines carried at higher levels than the supply lines specified in (1) above where involved in crossings, conflicts, or joint use of poles.

(b) Grade B.

Supply lines and signal lines under the conditions specified below shall comply with the requirements of Grade B.

(1) Constant-potential alternating-current supply lines normally operating at voltages between 5000 and 7500 between conductors or between 2900 and 4400 volts to neutral or ground, or constant-current circuits of between 7.5 and 10 amperes, where at higher levels and crossing over, conflicting with, or having poles with signal lines (except as noted in (c-3) below for certain signal conductors).

(2) Signal lines carried at higher levels than the supply lines specified in (1) where involved in crossings, conflicts, or joint use of poles.

(3) Supply lines specified in (a-1) above when at higher levels and crossing over, conflicting with, or having joint poles with signal lines carrying not more than four wires used mainly for local exchange service, or only subscribers, loops, or not more than two local telegraph or fire alarm wires.

(c) Grade C.

Supply lines and signal lines under the conditions specified below shall comply with the requirements of Grade C.

(1) Constant-potential alternating-current supply lines normally operating at voltages between 750 and 5000 between conductors or voltages between 440 and 2900 to neutral or ground and constant-current circuits of not more than 7.5 amperes and supply lines of more than 5000 volts in cable having permanently grounded continuous metal sheath or armor (and installed in compliance with order 1274) where at higher levels and crossing over, conflicting with, or having joint poles with signal lines.

(2) Signal lines carried at higher levels than the supply lines specified in (1), except as smaller conductor sizes are permitted by order 1283-d.

(3) Supply lines specified in (b-1) above when at higher levels and crossing over, conflicting with, or having joint poles with signal lines carrying not more than four wires used mainly for local exchange service or only subscribers loops, or not more than two local telegraph or fire alarm wires.

(4) Signal lines carried over trolley contact conductors of less than 750 volts shall comply with Grade C requirements as to conductor sizes and sags except as noted in order 1286.

Order 1235. Signal Lines Crossing Over Railways.

(a) Grade D.

Telephone, telegraph and other signal lines carried over railways operated by steam, electric, or other motive power shall, with the exceptions noted below in paragraphs (b), (c), (d), and (e), of this order, comply with the construction requirements of Grade D.

(b) Grade E.

Signal lines carried over minor tracks included in the following list shall conform to the requirements of Grade E.

(1) Spurs less than 2000 feet long, and not exceeding two tracks in the same span.

(2) Branches on which no regular schedule or operation is maintained.

(3) Narrow-gage tracks or other tracks on which standard rolling stock can not, for physical reasons, be operated.

(4) Tracks used only temporarily for construction or similar purposes for a period not exceeding one year.

(5) Tracks not operated as a public utility, such as industrial railways used in logging, mining, etc.

(c) Street Railways.

Signal lines carried over street railways not having overhead trolley contact conductors, need comply only with the general requirements for signal lines alone.

(d) Trolleys.

Where signal lines cross over trolley contact conductors of less than 750 volts to ground, they shall comply with the requirements of order 1283-d as to conductor sizes and sags. For trolley contact conductors of more than 750 volts to ground the requirements for crossing over supply lines must be met, namely, grade A for direct-current trolley lines, and grade A, B, or C for alternating-current trolley lines, depending upon the voltage.

(e) Signal Lines Classed as Supply Lines.

Signal lines which are classed as supply lines shall, where crossing over railways, comply with the construction requirements of order 1233.

Order 1236. Co-operation to Avoid Hazard.

Utility or parties responsible for location or construction of new facilities or change in voltage construction or operating method, shall consult with other utilities or parties between whose facilities and their own, conflicts may now or later be created for which precautionary construction measures will be necessary to prevent hazard, and the parties concerned shall co-operate with a view to preventing hazard.

Note: When supply or signal lines are projected which will parallel existing lines on or along the same highway street, alley, railway or other rights-of-way the new construction should, unless joint construction is recommended, be located on the opposite side of the highway, street, alley, railway or right-of-way from that occupied by existing line or lines of the other kind, and on the same side with its own kind.

SECTION 124. OTHER REQUIREMENTS FOR SUPPLY LINES OF GRADES A, B, AND C.

Order 1240. General Strength Requirements.

(a) Preliminary Assumption.

In the calculation of all stresses no allowance shall be made for deformation, deflection, or displacement of any part of the supporting structures.

(b) Transverse Strength.

The paragraphs which specify the transverse strength requirements for supporting structures relate to grade B construction unless otherwise stated. For grade C the transverse strength shall be not less than two-thirds of that required for grade B. For grade A the transverse strength shall be at least 50 per cent greater than that required for grade B.

Order 1241. Calculation of Stresses in Conductors.

(1) In computing the longitudinal stresses upon conductors and their supports, and the sags corresponding to given limiting stresses in conductors, the loading shall be assumed as the following:

(2) The resultant loading due to the weight of the conductor plus the added weight of a layer of ice one-half inch in radial thickness, combined with a transverse horizontal wind pressure of 8 pounds per square foot on the projected area of the ice-covered conductor. The minimum temperature shall be assumed as 0 deg. F.

Order 1242. Calculation of Loads upon Line Supports.

(a) Assumed Vertical Loading.

The vertical loads upon poles, towers, and crossarms shall be taken as their own weight, plus the weight of the ice-covered conductors supported. The thickness of ice coating shall be taken as ½ inch.

(b) Assumed Transverse Loading.

(1) In computing the stresses in poles and towers the loading shall be taken as follows:

(2) A horizontal wind pressure at right angles to the direction of the line, of 8 pounds per square foot upon the projected area of cylindrical surfaces of the conductor when covered with a layer of ice ½ inch in radial thickness and of the poles and towers without ice covering.

(c) Average Span Lengths.

The calculated loads upon poles, towers and crossarms shall be based upon the average span length of a section of line that is reasonably uniform as to height, number of wires, grade, and span length, except that the average value taken shall in no case be less than 75 per cent or more than 125 per cent of the actual average of the two spans adjacent to the structure concerned.

(d) Average of Three Poles.

A pole not individually meeting the transverse strength requirements will be permitted when reinforced by a stronger pole on either side if the average strength of the three poles meets the transverse strength requirements, and the weak pole has not less than 75 per cent of the required strength.

Exception. An extra pole inserted in a normal span for the purpose of supporting a service loop may be ignored, if desired, in the calculation of the strength of the line.

(e) Actual Span Lengths and Pole Strengths at Crossings.

In the case, however, of crossings over railroads or signal lines (other than those mentioned in order (1234-b-3, c-3), the actual lengths of the two spans adjacent to the two structures concerned, and the actual strengths of the crossing poles, shall be used.

Order 1243. Strength of Steel Poles and Towers and Other Metal Supports.

(a) Loads and Limiting Stresses.

(1) Steel supports, steel towers, and metal poles, together with their foundations, and guys when used, shall be so designed and constructed as to withstand the stresses due to the loads assumed in order 1242. Under those loads the calculated stresses in the steel members and in the guys shall not exceed the following values, which are intended to be limiting unit stresses, not in excess of the yield point, beyond which the structures as a whole would be liable to failure.

Structural Steel:	27,000 pounds per sq. inch
Tension	24,000 pounds per sq. inch
Shear	27,000—90L
Compression	—
Bolts, rivets, pins:	r
Shear	24,000 pounds per sq. inch
Bearing	48,000 pounds per sq. inch
Bending	85,000 pounds per sq. inch
Guys	One-half the ultimate strength.

(2) These values for structural steel are for material having an ultimate tensile strength between 55,000 and 65,000 pounds per square inch and a yield point not less than 50 per cent of the ultimate strength.

(b) Guys.

The use of guys to obtain compliance with these requirements is regarded as generally undesirable. When guys are necessarily used, the steel supports or towers unless capable of considerable deflection shall be regarded as taking all of the stress in the direction in which the guy acts, up to their safe working load, and the guys shall have sufficient strength to take the remainder of the assumed maximum stress.

(c) Total Minimum Strength.

Steel towers shall have a minimum strength sufficient, if all conductors are removed, to withstand a transverse force three times that computed for the tower alone.

(d) Foundations.

Steel towers or poles shall preferably be placed on concrete or other suitable foundations extending above the ground line. If, however, the steel is set in earth, it shall be suitably protected against injurious corrosion at and below the ground line.

(e) Anchor Towers.

When steel supports or towers are used which are not capable of withstanding approximately as great a force longitudinally as transversely, anchor towers shall be placed, at intervals not greater than 10 spans, which shall be able to withstand the combined longitudinal tension of all conductors up to 10,000 pounds plus one-half the excess above 10,000 pounds.

(f) Thickness of Steel.

(1) Steel poles or towers of grades A, B, and C shall have no less thickness of metal in members than the following:

Legs, galvanized, 3-16 inch; other members 1-8 inch.
Legs, painted, 1-4 inch; other members, 1-4 inch.

(2) Such steel poles or towers, including footings, shall be so constructed that all parts are accessible for inspection, cleaning and painting, when necessary, and that pockets are not formed in which water can collect. The ratio of L, the unsupported length of a compression member to r, the least radius of gyration of the member, should generally not be greater than 150 for legs and 200 for other members having figured stresses.

(g) Protective Covering or Treatment.

All iron or steel poles, towers, or supporting structures, and all hardware, including bolts, washers, guys, anchor rods, and similar parts of material subject to injurious corrosion under the prevailing conditions, shall be protected by galvanizing, painting, or other treatment, which will effectively retard corrosion.

Order 1244. Strength of Wood or Concrete Supports.

(a) New Poles.

Wood and reinforced concrete poles and their foundations and guys (when used) shall, when installed, be of such material and dimensions as will withstand the loads assumed in order 1242, without the stresses under these loads exceeding 50 per cent of the assumed ultimate strengths of the material.

(b) Maintenance.

Wood poles shall be replaced or reinforced when their strength has decreased to two-thirds that required for new installations for grades A and B construction, and to one-half for grade C construction.

(c) Selected Poles.

Except for crossing over railroads and over signal lines (other than those mentioned in order 1234-b-3 and c-3, two-thirds of hte movement on wood poles (calculated as in order 1240 and 1242) due to transverse wind pressure may be used in finding the stresses in the poles, under the following circumstances:

(1) The poles shall be specially selected clear wood poles.

(2) They shall have dimensions not less than those listed in Tables 41, 42 and 43 Appendix (B.-4). These dimensions correspond to poles usually classified as class A for grade A and as class B for grades B, and C.

(3) They shall be systematically inspected and maintained by treatment, repair, or replacement in accordance with 1244-b.

(d) Minimum Pole Sizes.

Wood poles in grades of construction A, B, and C shall be of selected timber free from observable defects that would decrease their strength and durability and shall have no less nominal top diameter than 6 inches, except that for grade A a minimum of 7 inches is required.

(e) Guys.

When guys are used to meet the strength requirements for wood or concrete poles, they shall be considered as taking, in the direction in which they act, the horizontal component of the entire load, the poles, acting as struts, resisting the vertical component.

Order 1245. Strength of Crossarms and Conductor Fastenings.

(a) Crossarms of Selected Yellow Pine or Fir.

The minimum cross-sectional dimensions of selected yellow pine or fir crossarms for grades A, B, and C construction shall be as follows:

	For grades A and B	For grade C
2 or 4 pin	3x4 in.	2¾x3¾ in.
6 or 8 pin	3¼x4¼ in.	3x4 in.

Exception: (1) Grade C signal line across arms may be 2¾x3¾ inches for 6 pins, and 3x4 inches for 10 pins.

(2) If of other material they shall have at least equal strength.

(b) Crossarm strength.

Cross arms for construction of grades A, B, or C shall, when installed, withstand the vertical loads specified in order 1242 without the stress under these loads exceeding 50 per cent of the assumed ultimate strength of the material. They shall also withstand any unbalanced longitudinal loads to which they are exposed, with a limit of unbalanced tension where conductor pulls are normally balanced, of 700 pounds at the outer pin.

(c) Bracing.

Crossarms shall be securely supported, by bracing, if necessary, so as to safely support all other loads to which they may be subjected in use, including linemen working on them. Any crossarm or buckarm except the top one shall be capable of supporting a vertical load of 225 pounds at either extremity in addition to the weight of the conductors. In general, they shall be maintained at right angles to the axis of the pole and to the direction of the attached conductors, and at wire cross overs shall be attached to that face of the structure away from the crossing, unless special bracing or double crossarms are used.

(d) Pins and Conductor Fastenings.

Pins, ties, and other conductor fastenings for grades A, B, and C construction shall have sufficient strength to withstand the unbalanced tension in the conductor, up to a limit of 700 pounds per pin or fastening.

(e) Height of Pin.

The height of the pin and of the conductor fastenings and the material and cross section of the pin shall be so chosen as to afford the required strength.

Order 1246. Conductors—Materials, Minimum Sizes, and Sags.

(a) Material.

All conductors of grades A, B, or C shall be of copper, aluminum (with or without steel reinforcement), copper-covered steel, or other material which will not corrode excessively under the prevailing conditions.

(b) Minimum Sizes.

Supply conductors (including lightning protection wires paralleling line conductors) shall not be smaller than indicated in the following table, except that longer spans may be used with any listed conductor size if the separations and clearances given in section 122 and the sags given in Appendix A are correspondingly increased.

TABLE IX. MINIMUM ALLOWABLE CONDUCTOR SIZES FOR SOLID OR STRANDED CONDUCTORS.

A. W. G. for Copper and Aluminum; Steel W. G. for Steel.

MEDIUM OR HARD DRAWN COVERED COPPER WIRES

Grade	Limiting Span Length in Feet 150	175	200	300
A & B	6	4	4	2
C	8	6	4	2

MEDIUM OR HARD DRAWN BARE COPPER WIRES

Grade	Limiting Span Length in Feet 150	175	200	300	400	500
A & B	6	4	4	4	2	2
C	8	6	4	4	2	2

SOFT DRAWN COPPER WIRES

Grade	Limiting Span Length in Feet 150	175	200
A	4	2	1
B	4	2	2
C	6	2	2

STEEL WIRES

Grade	Spans 150 Feet or Less	Spans Exceeding 150 Feet
A & B	6	4
C	9	6

ALUMINUM WIRES WITHOUT STEEL REINFORCEMENT

Grade	Spans 150 Feet or Less	Spans Exceeding 150 Feet
A, B & C	1	0

ALUMINUM WIRES WITH STEEL REINFORCEMENT

Grade	Spans 150 Feet or Less	Spans Exceeding 150 Feet
A, B & C	6	4

(c) Sags and Maximum Tensions.

In grades of construction A, B and C conductors of hard, medium and soft drawn copper and steel shall have normal sags at 60 deg. F. with no wind as nearly as practicable to those given in the tables of Appendix A.

Exception: Less sags than those listed may be used if pins, fastenings crossarms and poles of sufficient strength to withstand the corresponding increase in longitudinal stresses are used, but sags shall not be so decreased from the tabulated values, that, under the maximum assumed loading, the tension will exceed 50 per cent of the breaking strength of the conductors concerned for grades A and B construction, and 60 per cent for grade C construction.

(d) Taking up Slack.

Slack shall be taken up when, because of the permanent elongation of the wire or movement of supporting structures, the initial sags have so increased that the clearances or separations of conductors are materially below the requirements of the rules.

Order 1247. Line Insulators for Grades A and B Construction.

(a) High Voltage Insulators.

Insulators for operation on supply lines at voltages exceeding 7,500 volts shall be of porcelain or other material which will give equally good results in respect to mechanical and electrical performance and durability.

(b) Strain Insulators.

Where strain insulators are used they shall have the same electrical strength as other insulators on the line when under the normal mechanical stresses to which they may be subjected.

(c) Insulators at Grounded Structures.

Whenever wood pins and crossarms or other ungrounded supports are used within five spans of a crossing span at which the line conductors are attached to grounded metal pins, grounded crossarms, steel bridges, steel towers, or other grounded structures, the insulators at the grounded supports shall be capable of withstanding without flash-over a voltage 50 per cent higher than those used at adjacent ungrounded supports.

Exception: Where the supporting structures for the crossing span are the same with respect to grounding as for the other parts of the line, the insulators used may also be the same.

(d) Ratio Flash-Over to Puncture Voltage.

Insulators shall be so designed that their dry flash-over voltage is not more than 75 per cent of their puncture voltage at a frequency of 60 cycles per second.

(e) Factory Tests.

Insulators shall be capable of withstanding without flash-over at a frequency of 60 cycles per second the values given in the following table:

TABLE X.

Voltage of Circuit	Test Voltage Dry	Test Voltage Wet
750	5,000	3,500
2,300	11,000	8,000
4,000	17,000	13,000
6,600	27,000	20,000
7,500	30,000	22,000
11,000	40,000	30,000
22,000	75,000	55,000
33,000	105,000	75,000
44,000	135,000	95,000
55,000	160,000	115,000
66,000	185,000	135,000
88,000	235,000	170,000
110,000	285,000	200,000
150,000	375,000	225,000
200,000	490,000	250,000

(f) Protection Against Arcing.

In installing the insulators and conductors such precautions as are sanctioned by good modern practice shall be taken to prevent as far as possible any arc from forming or to prevent any arc which might be formed from injuring or burning any parts of the supporting structures, insulators, or conductors, which might render the conductors liable to fall.

Order 1248. Special Transverse Strength Requirements.

(a) Alternative Construction in Special Cases.

In the case of structure of Grades A or B construction where because of very heavy or numerous conductors or relatively long spans the transverse strength requirements of this section can not be met except by the use of side guys or special structures, and it is physically impracticable to employ side guys, the transverse strength requirements shall be met by side guying the line at each side of and as near as practicable to the crossing or other transversely weak structure, and with a distance between such side-guyed structures of not over 800 feet, provided:

(1) The side-guyed structures for each such section of 800 feet or less shall be constructed to withstand the calculated transverse load due to wind on the supports and ice-covered conductors, on the entire section between the side-guyed structures.

(2) The line between such side-guyed structures shall be substantially in a straight line and the average length of span between the side-guyed structures shall not be in excess of 150 feet.

(3) The entire section between the transversely strong structures shall comply with the highest grade of construction concerned in the given section, except as to the transverse strength of the intermediate poles or towers.

(b) Strength of Crossarm and Pins.

The crossarm, insulator pins, and conductor fastenings connected to the structure at each end of the transversely weak section in lines of grades A and B construction shall be such as to withstand, under the conditions of loading prescribed in order 1241, an unbalanced load equivalent to the combined pull in the direction of the transversely weak section of all the conductors supported up to 10,000 pounds plus one-half the excess for grade A, or plus one-fourth the excess for grade B.

Order 1249. Special Longitudinal Strength Requirements for Sections of Grades A and B Construction in Lines of a Lower Grade of Construction (or adjacent to Angles or Dead Ends).

(a) Required Strength.

The supporting structures (including poles, towers, crossarms, insulator pins, and conductor fastenings) for the ends of the higher grade section of the line shall be constructed to withstand without failure under the conditions of loading prescribed in order 1241 a longitudinal load equivalent (except as noted in d) to the combined pull in the direction of this section of all the conductors and wires supported, the pull of each conductor or wire being taken as the tension therein due to the prescribed loading. Where it is difficult to increase the longitudinal strength, the longitudinal stresses shall be reduced by increasing the conductor sags. This may require greater conductor separations.

Exception: Where this is impractical the supporting structures of the required longitudinal strength may be located one or more span lengths away from the section of higher grade, within 500 feet on either side and with not more than 800 feet between the longitudinally strong structures, provided such structures and the line between them meet the requirements, as to transverse strength and stringing of conductors, of the highest grade occurring in the section, and provided that the line between the longitudinally strong structures is approximately straight or suitably guyed.

(b) Modified Strength Requirements for Heavy Lines.

(1) In cases where the line is approximately straight on both sides of the section of higher grade and in line with it, the strength of each pole or each crossarm shall be such as to withstand the combined tensions in the conductors up to 10,000 pounds combined pull, plus one-half the excess above 10,000 pounds for grade A, and plus one-fourth the excess for grade B, if the line on one or both sides of the special construction should fail. In cases where, due to change of direction of the line or because of dead ends the longitudinal stresses in the conductors of the stronger section are not normally balanced by the conductors of the line beyond this construction, the construction shall be such as to withstand the total combined tension.

(2) Where the section of higher grade is not in line with the line beyond this section, suitable guys shall be placed to withstand the resulting transverse stresses.

SECTION 125. REQUIREMENTS FOR SUPPLY LINES, INCLUDING ELECTRIC RAILWAY FEEDERS.

Order 1250. Compliance with Other Orders.

(a) Grade B, or C Construction.

In addition to the requirements of sections 120, 121, and 122, the requirements of this section shall be met by all supply lines in urban and rural districts where a definite grade of construction B, or C is required by section 123, except in the important cases of crossings over railways or signal lines, conflicts, and the joint use of poles, which are covered by sections 126 and 127.

(b) Special Strength.

Special longitudinal strength requirements are made in order [illegible] crossing of supply lines of less than 7500 volts and of cabled supply lines exceeding 7500 volts over supply lines of more than 7500 volts, [illegible] districts.

(c) Dead Ends.

Where supply lines of more than 7500 volts in urban districts come to dead ends or to changes in line direction (even where no crossing exists) they shall have construction complying with the longitudinal strength requirements of order 1249.

(d) Clearances.

For clearances of conductors and wires above roadways, railways and footways, and from other conductors and wires see orders 1220, 1257, and 1258.

Order 1251. Supply Lines in Urban Districts.

(a) Lines of Less Than 750 Volts.

(1) Supply lines of less than 750 volts in urban districts where alone, or where crossing over, conflicting with, or where higher and on common poles with other supply lines of less than 750 volts need only comply with the general requirements of sections 120, 121 and 122.

(2) If the lower supply lines have a voltage greater than 750 volts and are not in cable having permanently grounded continuous metal sheath or armor and are not installed in compliance with orders 1274-c, d, e and f, both lines shall comply with the requirements of grade C; if the lower supply lines are of more than 7500 volts and not in such cable both lines shall comply with the requirements of grade B.

(b) Lines of Voltage Between 750 and 7500.

(1) Supply lines of voltages between 750 and 7500 in urban districts, where alone, or where crossing over, or conflicting with, or where higher on common poles with, other supply lines of not more than 7500 volts shall comply with the construction requirements of grade C, as given in section 124, unless the supply lines are in cable having permanently grounded continuous metal sheath or armor and are installed in compliance with orders 1274-c, d, e and f, in which case no grade is required.

(2) If the lower supply lines have a voltage greater than 7500 and are not in such cable, both shall comply with the construction requirements of grade B.

(c) Lines of More than 75 Volts.

Supply lines of more than 7500 volts in urban districts where alone, or on the same poles with other supply lines of any voltage, or crossing or conflicting with such lines, shall comply with the construction requirements of grade B.

Exception: Such lines if in cable having permanently grounded continuous metal sheath or armor and installed in compliance with order 1274 need only comply with the construction requirements of grade C.

Order 1252. Supply Lines in Rural Districts.

(a) No Grade.

Where supply lines of any voltage in rural districts are not concerned with crossing of railways or signal lines, or conflicts or joint use of poles with signal lines, no grade of construction is required for conductors or supports, except as noted in (b) below. Such lines are subject only to sections 120, 121, and 122 for isolation, guarding, clearances, and pole arrangement, etc.

(b) Grade C.

When either of two supply lines in rural districts, one of more than 7500 volts and the other of less than 750 volts, crosses, conflicts with, or has common poles with the other, the upper one shall be of grade C, unless the line of higher voltage is in cable having permanently grounded continuous metal sheath or armor and is installed in compliance with order 1274-c, d, e and f.

Order 1253. Constant-current Lines.

Where supply lines only are concerned, constant-current lines are included with constant-potential lines and graded by the nominal full-load voltage of the circuit concerned.

Order 1254. Common Use of Poles by Different Supply Lines.

(a) Relative Levels.

Poles or towers used in common by supply lines of different voltage classification, including trolley feeders, whether owned by the same or different utilities, shall have all supply lines arranged as to relative levels, separations, and clearances according to the requirements of section 122.

Exception: Where poles are used in common by separately owned utilities each of which may have supply conductors of different voltages on the same pole, supply conductors of a lower voltage of one utility may be placed at a higher level than those of a higher voltage of another utility in order to admit of keeping each utility's supply conductors in adjacent positions on the pole, provided that:

(1) Conductors of a lower voltage classification shall never be at a higher level than those of a higher classification, unless on the opposite side of the pole or

(2) that a vertical spacing of not less than 4 feet is maintained between the nearest line conductors of the respective utilities, and this spacing be identified if necessary as a division space.

(b) Grade of Construction.

(1) Poles or towers used in common by supply lines, as noted in (a), shall have the grade of construction determined by section 123 for the highest voltage lines carried on such poles or towers, all conductors of all voltages being included in the computations of stresses on the poles or towers.

(2) The crossarms, pins, and fastenings of conductors on poles or towers used in common by supply lines, as noted in order 1254-a shall have the grade of construction determined by section 123 for the lines carried by the crossarm, pin, or fastening in question, according to their relation to other lines carried on the poles or towers.

(c) Conductor Size and Sag.

The size and initial sag of each conductor shall be determined by its own voltage and the grade of construction required for it, according to its relation to other conductors carried on the pole or tower.

(d) Trolley Wires.

Where a trolley contact conductor is supported on a commonly used pole, it shall be included in the computation of transverse stress on the structure.

Order 1255. Electric Railway Feeders and Contact Conductors.

(a) Trolley Feeders as Supply Lines.

Except where specifically exempted (as for clearances and elevation in rules for common use of poles in this section and in section 122) trolley feeders shall be considered and constructed in all respects as supply lines of equal voltage.

(b) Third Rails.

Third rails shall be protected where not on fenced rights of way by overlapping guards composed of wood or other suitable material.

(c) Trolley Contact Conductor Supports.

All overhead trolley contact conductors shall be so supported and arranged that the breaking of a single conductor fastening will not allow the trolley conductor or live span wire or current-carrying connections to come within ten feet from the ground or from any platform accessible to the general public. Span/wire insulation for trolley contact conductors shall comply with order 1213-f.

(d) High Voltage Contact Conductors.

Every trolley contact conductor of more than 750 volts in urban districts (where not on fenced right of way) shall be so suspended that if broken at a single point it cannot fall within 12 feet from the ground or any platform accessible to the general public.

(e) Supply Lines Over Trolley Contact Conductors.

Supply conductors carried over trolley contact conductors shall conform to the same requirements as where crossing over supply lines of equal voltage whether in urban or rural districts.

Order 1256. Electric Railway Construction.

(a) Assuring Against Loss of Power at Railway Crossings.

Unless electric-railroad systems are protected by interlocking derails or gates at grade crossings with interurban or other heavy or high-speed railroad systems the trolley-contact conductors shall either be arranged with live trolley guards of suitable construction or shall be at the same elevation above their own tracks throughout the crossing and next adjoining spans, with catenary construction for crossing spans exceeding 100 feet.

(b) Guards Under Bridges.

While passing under steel bridges that are not sufficiently elevated to prevent a trolley pole from making contact with the bridge in case it leaves the contact conductor, a substantial inverted trough or other guard of insulating material shall be so installed as to prevent the trolley pole from making an electrical connection between the contact conductor and the bridge structure.

(c) Construction of Railway Crossings.

Trolley contact conductors and feeders and their supporting structures, where crossing over railways, shall conform to the strength requirements specified for supply lines under section 124 and order 1260. The clearance of trolley construction supports from the rails of railways crossed over shall comply with the requirements for supply line supports under order 1211-d.

(d) Strength of Construction in Urban Districts Generally.

Trolley contact conductors, feeders, and their supports, in urban districts, shall comply with the strength requirements for supply lines of equal voltage. Direct-current circuits of more than 750 volts to ground where at higher levels and crossing over, conflicting with, or higher than and having joint poles with, signal lines shall comply with the requirements of grade A.

Order 1257. Wire Clearances Above Railways, Roadways, and Footways.

The clear space between the lowest overhead trolley contact conductor or feeder, or guy, span, or messenger wire and the surfaces of rails, streets, highways, or alleys over which the former passes shall not be less than given in Table III or order 1220-a.

Order 1258. Clearances of Contact Conductors From Other Wires at Crossings.

The clear space between the trolley-contact conductor and the lowest overhead conductor or wire crossing above shall be not less than the following at 60 deg. F. with no wind.

	Feet
Signal lines	4
Supply lines, 0 to 750 volts	4
Supply lines, 750 to 7,500 volts	6
Supply lines, 7,500 to 50,000 volts	6
Guy, span, and messenger wires and service loops	4
If trolley-contact conductor is of more than 750 volts, no conductor shall cross at less than	6

Exception: Trolley feeders are exempt from a clearance requirement from contact conductors at the same nominal potential and of the same system.

SECTION 126. CROSSINGS OF SUPPLY LINES OVER RAILWAYS.

Order 1260. Grades of Construction.

Overhead supply lines (or signal lines which have taken on the character of supply lines) crossing over railways shall comply with the construction requirements of grade A, except when over spurs, branches, or other minor tracks only, in which case they shall comply with the construction requirements of grade B.

Order 1261. Compliance with Other Orders.

Such overhead supply lines shall comply as to conductor sizes, materials, and sags, and as to materials, sizes, and strength of supporting structures and attachments with the requirement of sections 124 and order 1270-c; as to separations, clearances and relative levels of conductors and wires on the line itself, with the requirements of section 122; as to guys and their insulators, with the requirements of order 1212 and 1213 and in general with the requirements of sections 120 and 123.

Order 1262. Pole Clearance to Rail.

(1) Poles or towers supporting the crossover spans of overhead supply lines over railways shall, unless physical conditions or municipal requirements prevent, have side clearance not less than 12 feet from the nearest track rail, except that at sidings a clearance not less than 7 feet is allowed. At loading sidings sufficient space shall be left for a driveway.

(2) If overhead lines of the railway are crossed over, the poles or tower structures of each line concerned in the crossover shall have clearances from the conductors of the other line as required by order 1221 or 1227-a, whichever applies.

Order 1263. Wire Clearances Above Rail.

The clear space between the lowest overhead supply line conductor or wire and the heads of rails above which the former cross shall not be less than the following at 60 deg. F. with no wind, where the conductor or wire has fixed supports and the span does not exceed 150 feet.

(a) Clearances Where Men Are Permitted on Cars.

Above track rails of steam railways.

(1) Supply lines of less than 300 volts to ground, overhead ground wires, and their guys, messenger, and span wires, 27 feet.

Exception: This may be reduced to 25 feet where lines are paralleled by trolley contact conductors on same street or highway.

(2) Supply lines, 300 volts to ground up to 15,000 volts, 28 feet.

Exception: This may be reduced to 25 feet where lines are paralleled by trolley contact conductors on same street or highway.

(3) Supply lines, 15,000 to 50,000 volts, 30 feet.

Exception: For conductors above 50,000 volts the given clearance shall be increased at the rate of 0.5 inch per 1,000 volts excess.

(4) Trolley Contact Conductors, 22 feet.

(See also order 1256.)

(b) Increased Clearance for (a)

The clearances of (a) apply to spans not exceeding 150 feet. For longer spans they shall be increased by 1 inch for each 10 feet of the excess between 150 and 300 feet and by 1 inch for each 20 feet of the excess beyond 300 feet.

Order 1264. Crossover Wire Clearances to Railway Wires.

The clear space between the lowest overhead supply line conductor or guy or span wire and the highest conductor or wire crossed over concerned in the operation of the railway (except for crossings between conductors and guy or span wires on the same poles, for which see order 1221) shall not be less than given below, at 60 deg. F. with no wind, where the upper conductor or wire has fixed supports (pin or strain-type insulators), and the sum of the distances from the point of intersection to the nearest supporting structure of each span, does not exceed 100 feet. (When crossing over supply conductors of the railway in excess of 7500 volts, the clearances of order 1220-c apply)

(1) Above signal conductors (of railways):

	Feet
Supply lines 0 to 750 volts	4

This may be reduced to 2 feet if the crossing is not within 6 feet of any pole concerned in the crossing and the voltage is not more than 300 volts.

	Feet
Supply lines, 750 to 7,500 volts	4
Supply lines, 7,500 to 50,000 volts	6
Service supply connections (0 to 750 volts)	2
Guy, messenger, and span wires	2

(2) Above supply conductors of not more than 7,500 volts. (Signal conductors are defined as supply conductors when operating at more than 400 volts to ground and supplying railway signal systems.)

	Feet
Supply lines, 0 to 750 volts	2
Supply lines, 750 to 7,500 volts	2
Supply lines, 7,500 to 50,000 volts	4
Guy, messenger, and span wires*	4

*May be reduced to 2 feet when voltages do not exceed 750 volts.

Order 1265. Increase of Clearances in Special Cases.

(2) Clearance Increase for Long Spans.

The clearances of order 1264 shall be increased where the sum of the distances from the point of intersection to the nearest supporting structure of each span exceeds 100 feet by 2 inches for each 10 feet of the excess between 100 and 200 feet, and by 2 inches for each 20 feet of the excess beyond 200 feet.

(b) Clearance Increase for High Voltage.

The clearances of order 1264 shall be increased, where the supply line voltage exceeds 50,000 volts, by 0.5 inch per 1000 volts of the excess.

(c) Clearance Increase for Suspension Insulators.

The initial clearances, where the upper line at a grade A or B crossing over track rails or signal lines is supported by suspension insulators, shall be sufficient to prevent the minimum clearances of orders 1263 and 1264 from being reduced through the breaking of a conductor in either adjoining span by more than 10 per cent over rails or by more than 25 per cent over conductors or wires.

(d) Increases Cumulative.

The above increases are cumulative when more than one applies.

Order 1266. Protection Against Conductor Breakage.

(a) Splices and Taps.

Splices shall not be made in the crossing span and preferably not in the adjacent spans, which are depended upon for withstanding the longitudinal stress of the crossing conductors. If a splice or tap is made in any conductor in the span next to the crossover span, it shall, where practicable, be placed at a point nearer to the crossover support than is the nearest conductor crossed over.

(b) Falling Trees.

The crossing span and the next adjoining spans, shall as far as practicable be kept free from overhanging or decayed trees, which might fall into the line.

Order 1267. Special Short Span Crossing Construction.

In cases where the crossover span is constructed of such height and so arranged that, in the event of breakage, no part of any conductor concerned in the crossing can come within 15 feet of the ground or of the rails, the requirements specified in section 124 as to conductor sags and sizes are, so far as they are required by reason of the railroad crossing, waived provided that a permanently grounded guard arm is installed at each crossover support in such manner as to prevent conductors which break in either adjacent span, from swinging back into the space between the crossover supports.

Order 1268. Underground Lines Crossing Under Railways.

Underground supply lines crossing railways shall comply with the requirements of sections 120 and 129, and particularly of orders 1290 and 1295. These orders require that manholes, pull boxes, and terminals shall, where practicable, be located away from the roadbed, and that conductors and cables carried underground, under railways, shall be placed in suitable ducts.

SECTION 127. SUPPLY LINES OVER SIGNALS LINES AND JOINT USE OF POLES.

Order 1270. Special Requirements and Compliance with other Orders.

(a) Grade of Construction.

Overhead supply lines crossing over signal lines under the circumstances noted in order 1234 shall comply with grades of construction A, B, or C, as noted in the order referred to.

(b) Compliance with Other Orders.

Such overhead supply lines shall comply as to conductor sizes, materials, and sags and as to materials, sizes and strength of supporting structures and attachments with section 124; as to separations and clearances of conductors and wires of the supply line itself with the requirements of section 122; and as to guys and their insulators with the requirements of orders 1212 and 1213.

(c) Where Concerned with Other Overhead Lines or With Railways.

Such overhead supply lines where also concerned at the crossover with crossings, conflicts or common use of poles with overhead lines other than the signal lines crossed over, or with a railway crossing, shall comply also with the requirements of order 1230 as to relative levels and with orders 1231 to 1235 as to character of construction, with orders 1281 and 1282 as to guying span length, etc., and with orders of this section which apply to these conditions.

(d) Pole Clearance.

The pole or tower structures of each line concerned in the crossover shall have clearances from the conductors of the other line, as required by orders 1221 or 1227-a, whichever applies.

(e) Wire Clearance Above Signal Wires.

The clear space between the lowest overhead supply line conductor or guy, messenger, or span wire, and any signal line conductor or guy, span, or messenger wire over which it crosses (except for crossings between conductors and guy, messenger, or span wires on the same pole, for which see order 1221) shall not be less than given below at 60 deg. F. with no wind, where the upper conductor or wire has fixed supports (pin or strain-type insulators), and the sum of the distances from the point of intersection to the nearest supporting structure of each span does not exceed 100 feet.

(1) Above signal conductors:

	Feet
Services, 0 to 750 volts	2
Supply lines, 0 to 750 volts	4

Exception: This may be reduced to 2 feet, if the crossing is not within 6 feet from any pole concerned in the crossing, and the voltage is not over 300 volts.

	Feet
Services and supply lines, 750 to 7,500 volts	4
Services and supply lines, 7,500 to 50,000 volts	6
Guy, messenger, and span wires	2

(2) Above guy, span, or messenger wires (of signal lines):

	Feet
Supply lines, 0 to 750 volts	2
Supply lines, 750 to 50,000 volts	4
Guy, messenger, and span wires	2

(f) Clearance Increases.

The increase of clearances for longer spans, higher voltages, and for suspension insulators, shall be as given in order 1220-d.

(g) Special Requirements.

Special longitudinal strength requirements are given in order 1249.

Order 1271. Supply Lines Conflicting with Signal Lines.

(a) Strength of Construction.

Where supply lines are at higher levels and conflict with signal lines, the requirements of order 1270 apply in general to the conflicting supply lines, just as they apply where the supply lines cross over the same signal lines.

(b) Avoidance of Conflict.

Two parallel pole lines, either of which carries supply lines, shall, where practicable, be so separated from each other that neither conflicts with the other.

Order 1272. The Joint use of Poles by Signal and Supply Lines—Supply Lines above Signal Lines.

(a) Avoidance of Conflict by Joint Use.

The separation of two parallel pole lines, one of which carries supply conductors and the other signal conductors shall, where practicable, be sufficient so that neither conflicts with the other, and if within conflicting distance, they shall be separated as far as practicable.

(b) Strength of Poles.

Poles used jointly by supply lines and signal lines with the supply lines above shall have the highest grade of construction specified in order 1234 according to the voltage and character of the various lines carried by the pole.

Exception: Where the signal lines are used exclusively in the operation of supply lines the grade of construction need not be that required above but the lines shall occupy the same relative positions noted under (f) below.

(c) Conductor Supports.

The strength of crossarms, pins, and fastenings shall conform to the highest grade of construction required for the lines carried by the particular crossarm concerned, according to order 1234. This may sometimes be a lower grade than that required for the pole or tower by reason of other lines carried on higher crossarms.

(d) Special Provision Regarding Transverse Strength.

In calculating the transverse forces upon poles carrying supply conductors above signal conductors, where no supply conductors are below signal conductors, and where the reduction in transverse movement given in order 1244-c is not used, the number of signal conductors upon which the transverse force is calculated shall be taken as only one-half their total number, provided that they are smaller than No. 8 stl. W. G. if steel, or No. 6 A. W. G. if copper.

(e) Longitudinal Stresses.

In calculating the longitudinal stresses upon jointly used poles complying with grade A or B construction requirements where crossing over railways or over signal lines (where these crossings would of themselves require compliance with grade A or B construction of the crossover span) the tension in the signal conductors shall be considered as limited to one-half their breaking strength provided they are smaller than No. 8 stl. W. G. if of steel or No. 6 A. W. G. if of copper, regardless of how small the initial sags of the signal conductors at 60 deg. F.

(f) Clearances, Separations, and Relative Levels.

The clearances and separations of supply signal conductors on jointly used poles, as well as the relative levels are covered in detail in orders 1224 and 1230. In general, signal lines for public use shall not be less than 4 feet below supply lines.

Exception: (1) Span wires or brackets for supporting lamps or trolley contact wires on jointly used poles may have less clearance from signal attachments than specified in the foregoing, but in no case shall the clearance be reduced below the following:

(2) From span wires or brackets for lamps or trolley contact wires to crossarms carrying signal conductors, 2 feet; to messenger wire carrying signal cables, 1 foot; to terminal boxes of signal cable, 1 foot.

(3) Where it is not practicable to obtain a clearance of one foot to terminal boxes of signal cable, all metal parts of terminals shall have the greatest practicable separation from fixtures or span wires including all supporting screws and bolts of both classes of attachments.

Order 1273. The Joint use of Poles by Signal and Supply Lines—Signal Lines Above Supply Lines.

(a) Strength Requirements.

Poles or towers used jointly by signal and supply lines, with the signal lines above the supply lines, shall comply with the requirements and rules referred to in order 1272 as well as those in this order.

(b) No Reduction.

The grade of construction A or B where required for the signal lines, includes the size, material, and sag of conductors as well as the strength of structures required for supply lines of the same grade by section 124 with no reduction in transverse strength requirements such as is permitted by order 1272-d, where supply lines are above signal lines.

(c) Grade C Signal Conductors.

Signal conductors which are required to comply with grade C construction may be smaller than grade C supply conductors, but must not be smaller nor have less sags than for grade D construction for spans up to 150 feet; for spans over 150 feet the requirements for supply conductors must be met.

(d) Minor Extensions.

In localities where the practice of placing conductors of signal circuits for public use above supply conductors has been generally established, minor extensions with the conductors in the same relative positions and with the clearances covered by the table may be made in either system, but these extensions shall not continue beyond a location at which it becomes practicable to change to the arrangement standardized by these rules.

Order 1274. The Joint use of Poles by Cabled Supply Lines and Signal Lines.

(a) Requirements When Cable is Unsheathed.

Poles used jointly by signal lines and cabled supply lines not having permanently grounded continuous metal sheath or armor shall meet all the requirements for poles used jointly by open supply and signal lines given in order 1272.

(b) Strength of Poles when Cable is Sheathed.

Cabled supply lines having permanently grounded continuous metal sheath or armor shall be installed in compliance with (c), (d), (e), and (f), below. When the voltage of the cabled supply lines is greater than 750, the poles shall meet the strength requirements of grade C as given in Section 124.

(c) Messengers.

Messengers shall be stranded and of galvanized or copper covered steel with strengths and sags as specified in order 1283 (f) or if other sizes shall not be stressed beyond half their ultimate strength when the cable and messenger are coated with ½ inch of ice and subjected to a transverse wind pressure of 8 pounds per square foot of projected area.

(d) Grounding of Cable Sheath.

Each section of cable between splices shall be suitably and permanently bonded to the messenger wire at not less than two places. The messenger wire shall be grounded at the ends of the line and at intermediate points not exceeding eight hundred feet apart.

(e) Splices.

Splices in the cable shall be so made that their insulation is not materially weaker than the remainder of the cable. The sheath or armor at the splice shall be made electrically continuous.

(f) Insulation.

The conductors of the cable shall be so insulated as to withstand a factory potential test of at least twice the operating voltage at operating frequency applied continuously for five minutes between conductors and between any conductor and the sheath or armor.

Order 1275. Special Crossing Construction.

(a) Short Spans.

In cases where the crossover span is constructed of such a height that its length is less than the distance between either point of support of its lowest conductor and the highest conductor of the line crossed, the requirements for conductor sags and for size and type of conductors in section 124 are waived, provided that a permanently grounded guard-arm is installed at each crossover support in such a manner as to prevent conductors, which break in either adjacent span, from swinging back into the conductors of the span crossed over.

(b) Cradles.

Cradles are not recommended. It is less expensive and better to build the supply line strong enough to withstand extreme conditions than to build a cradle of sufficient strength to catch and hold the supply line if it falls.

SECTION 128. STRENGTH AND OTHER REQUIREMENTS FOR SIGNAL LINES AT CROSSINGS AND ALONE.

Order 1280. General Requirements.

(a) Conditions Determining Grade.

(1) Signal lines crossing over railways, except in the cases mentioned in order 1235-b, c, d and e, are classed as grade D and shall have construction in accordance with the following requirements. Signal lines crossing over minor tracks (as described in order 1235-b) shall conform to the requirements for grade E.

(2) Where also crossing over supply lines (or signal lines having the character of supply lines) in the same span, the construction required shall comply either with grade D, grade E, or with grade A or B according to the voltage of the supply line.

(3) Signal lines crossing over the supply lines covered in order 1234-c and also crossing over railways in the same span, shall comply with grade D or E requirements except that grade C requirements apply to conductor sizes and sags for spans exceeding 150 feet.

(b) Transverse and Longitudinal Strength

The paragraphs which specify the transverse and longitudinal requirements relate to grade D construction unless otherwise stated. For grade E the transverse and longitudinal strength shall be not less than two-thirds of that required for grade D.

(c) Preliminary Assumption.

In the calculation of all stresses no allowance shall be made for deformation, deflection, or displacement of any part of the supporting structures.

(d) Inspection.

All parts of the supporting structures of the crossing span shall be examined periodically by the owner and all defective parts shall be promptly restored to a safe condition.

Order 1281. Transverse and Longitudinal Strength.

(a) Transverse Guying.

(1) The poles supporting the crossing span shall be side guyed or braced to withstand the transverse load put upon them in accordance with the conditions specified below. The guys shall be considered as taking, in the direction in which they act, the horizontal component of the entire load, the poles, acting as struts, resisting the vertical component. The calculated stresses in the guys shall not exceed one-half the ultimate strength of the material.

(2) The assumed horizontal wind pressure at right angles to the direction of the line upon the poles and conductors shall be taken as 8 pounds per square foot of projected area on cylindrical surfaces. The pressure shall be computed upon the poles without ice covering, while the conductors shall be assumed to be covered with a layer of ice one-half inch in radial thickness. In computing the transverse pressure on conductors the actual number of conductors shall be used up to 10. For larger numbers of wires only two-thirds of the total number shall be counted with a minimum of 10.

(3) In calculating transverse load a cable with its supporting messenger with the ice covering shall be figured at their full value. (See exceptions below.)

(b) Longitudinal Guying.

(1) The poles supporting the crossing span shall be head guyed away from the crossing so as to withstand the load specified below. The guys shall be considered as taking, in the direction in which they act, the horizontal component of the entire load, the poles, acting as struts, resisting the vertical component. The calculated stresses in the guys shall not exceed the ultimate strength of the material.

(2) The longitudinal load shall be assumed equivalent to an unbalanced pull in the direction of the crossing of all conductors or wires supported, the pull of each conductor or wire being taken as one-half its ultimate strength. In any case where the total pull exceeds 10,000 pounds the load shall be taken as 10,000 pounds plus one-quarter of the excess above 10,000 pounds.

(3) For head guying, cables are not included in the count of wires since the messenger serves as a head guy.

Exception to order 1281-a and b. If a pole is of such strength that it will not be stressed by the specified transverse loading be on one-fourth its ultimate strength when installed, side guys may be omitted. If the specified longitudinal loading on such a pole will not stress it initially beyond one-half its ultimate strength and there are not more than two wires in the crossing span, head guys may also be omitted.

(2) Where an overhead crossing which makes an angle with the tracks of less than 45 degrees involves at either crossing pole an angle in the pole line, the side guy within the angle may be omitted.

(3) Where a signal line paralleling a railroad track on the right of way of the railroad crosses a spur or stub-track without any change in general direction of line, the transverse strength requirements for grade E construction may be met without the use of side guys, providing the pole is not stressed beyond one-half its ultimate strength, and no requirements for longitudinal strength are made if conductor tensions are balanced. Where conductor tensions are not balanced, due to a small angle in the line at one or both poles or to dead ending any of the wires, guys or braces shall be installed capable of withstanding such unbalanced tensions.

(4) Where on account of physical conditions it is impracticable to guy or brace the crossing poles as specified above, the requirements there given may be met by head guying and side guying the line as near as practicable to the crossing, but at a distance not exceeding 500 feet from the nearest crossing pole, provided that the line is approximately straight and that a cable of strength equivalent to that of the head guy is run between the two guyed poles, being attached to the guyed poles at the point at which the head guys are attached, this cable being securely attached to every pole between the guyed poles.

Order 1282. Relation of Crossing Span to Line.

(a) Span Length.

(1) Poles shall, where practicable, be so located that crossing and adjacent spans are in a straight line and free from exposure to overhanging or closely adjacent trees or inflammable material or structures.

(2) The crossing span shall be as short as practicable, and in general shall not be longer than the normal span of the line. No crossing span shall exceed 125 feet in length if this can be avoided.

(b) Grading or Vertical Displacement of Crossing Span.

The vertical distance from the top crossarm of a crossing pole to a straight line connecting the top crossarm of the next adjacent pole on either side of this crossing pole, shall not exceed the values given in the following table:

Average Length of Span in Feet	Allowable Vertical Distance in Feet
Less than 100	4
100 to 130	5
Exceeding 130	6

Order 1283. Minimum Sizes and Construction Details.

(a) Size of Pole and Setting.

Wood poles supporting the crossing span shall be of selected timber, sound and reasonably straight. Poles shall have dimensions not smaller than the values given in the tables of Appendix B when carrying the numbers of wires there designated.

(1) **Grade D.** The minimum dimensions given in the tables of Appendix B correspond to poles designated by the wire-owning companies as class C, where not more than 20 wires are carried; class B, where 21 to 40 wires are carried; class A, where more than 40 wires are carried.

(2) **Grade E.** The minimum dimensions given in the tables of Appendix B correspond to poles designated by the wire-owning companies as class C where not more than 40 wires are carried; class B where more than 40 wires are carried.

(b) Crossarms.

(1) Wood crossarms supporting the crossing span shall be of yellow pine, fir, or other suitable timber and shall have a minimum section of 2¾ by 3¾ inches. Galvanized or painted iron or steel crossarms of equal strength may be used.

(2) Crossarms and insulators shall be double on the crossing poles. The crossarms shall be held together with properly fitted spacing blocks or bolts placed immediately adjoining the outside pins and shall not support more than 10 conductors.

(c) Pins, Insulators and Tie Wires.

(1) Insulator pins shall be of steel, wrought iron, malleable cast iron, or locust or equivalent wood. Steel or iron pins shall have a shank diameter not less than ½ inch. Wood pins shall be sound and straight grained with a diameter of shank not less than 1¼ inches. Insulator pins shall have strength sufficient to withstand the loads to which they may be subjected.

(2) Each insulator shall be of such pattern, design and material that when mounted it will withstand, without injury and without being pulled off the pin, the ultimate strength of the conductor attached to the insulator. The conductors shall be securely tied to each supporting insulator.

(d) Conductors.

(1) Conductors shall be of hard-drawn copper, copper-covered steel, galvanized steel or other hard-drawn, corrosion-resisting metal, provided, however, that galvanized steel shall not be used in localities where excessive corrosion would result.

(2) If spans in excess of 150 feet are necessary, the size of conductors specified or the sags shall be correspondingly increased.

(3) Conductors of material other than the above shall be of such size and so erected as to have a mechanical strength not less than that of the sizes of copper conductors given below.

(4) Twisted pair wires without a supporting messenger shall in no case be used for grade D in spans longer than 100 feet, nor for grade E in spans longer than 125 feet, and shall be eliminated as far as practicable. Each wire of a twister-pair not supported by a messenger shall be tinned hard-drawn copper not smaller than No. 14, or tinned copper-covered steel not smaller than No. 17 or equivalent.

(5) The minimum allowable sizes for conductors of the crossing span shall be as follows:

TABLE XI. (1) MINIMUM WIRE SIZES FOR GRADE D.

Conductors	Spans 125 Feet or Less	Spans Over 125 Feet and Not Over 150 Feet
Hard drawn copper	No. 10 A. W. G.	No. 9 A. W. G.
Galvanized steel	No. 8 Stl. W. G.	No. 10 Stl. W. G.
Galvanized steel in rural districts	No. 12 Stl. W. G.	No. 10 Stl. W. G.

TABLE XII. (2) MINIMUM WIRE SIZES FOR GRADE E.

Conductors	Spans 125 Feet or Less	Spans Over 125 Feet and Not Over 150 Feet
Hard drawn copper	No. 10 A. W. G.	No. 10 A. W. G.
Galvanized steel	No. 12 Stl. W. G.	No. 10 Stl. W. G.

(3) MINIMUM WIRE SIZES FOR GRADE C

Signal conductors which are required to comply with grade C construction may be smaller than grade C supply conductors, but shall not be smaller nor have less sags than for grade D construction for spans up to 150 feet; for spans over 150 feet the requirements for supply conductors shall be met.

Conductors of the crossing span shall be strong with sags not less than shown in the following table:

TABLE XIII. SAGS OR HARD DRAWN, BARE COPPER WIRE OR STEEL

Length of Span in Feet	Sag in Inches At 20° F.	Sag in Inches At 60° F.	Sag in Inches At 100° F.
80	2.5	4.5	8.5
90	3.5	5.5	10
100	4.5	7	12
110	5.5	8.5	14
120	6.5	10	16
130	7.5	12	19
140	9.5	15	22
150	11.5	18	25

(e) Guys.

Guy anchors shall, where possible, be located so that the horizontal distance from the ground line of the pole to the guy or guy rod will be not less than the height above ground of the attachment of the guy to the poles for head guys, and not less than one-third that height for side guys. The guys shall be attached as near to the center of the load as practicable. The guys and anchors shall be maintained so that the guys are kept taut and serve the purpose for which they are intended.

(f) Messenger.

(1) The following table gives the minimum sizes of galvanized steel strand messenger cable to be used for supporting different sizes of conductor cable:

TABLE XIV. MINIMUM SIZES OF MESSENGER CABLE.

Size of Conductor Cable in Weight per Foot	Messenger Cable (Nominal) Ultimate Tensile Strength
Less than 2.25 pounds	6,000 pounds
2.25 to 5 pounds	10,000 pounds
Exceeding 5 and less than 8 pounds	16,000 pounds

(2) For spans exceeding 150 feet or for heavier cables a proportionately larger messenger cable or other proportionately stronger means of support shall be used.

(3) Multiple wire cables and their messengers shall be suspended with a normal sag at 60 deg. F., so that when they are subject to the loading prescribed in order 1281 the tension in the messenger cable will not exceed the following values.

Nominal Ultimate Tensile Strength of Messenger Cable	Safe Working Tension of Messenger Cable
6,000 pounds	3,500 pounds
10,000 pounds	5,900 pounds
16,000 pounds	9,500 pounds

Order 1284. Signal Line Clearances.

(a) Clearances From Ground or Rails.

(1) The clear space between the lowest signal conductor, guy or messenger and the heads of rails shall, at 60 deg. F. with no wind, be in general not less than 27 feet.

(2) When the signal conductors are paralleled on the same highway by a trolley contact conductor at a lower level, the clearance of the signal conductors from the rail may be reduced to 25 feet.

(3) When signal conductors cross tracks not carrying traffic which involved brakemen riding on top of standard freight cars, the above clearance may be reduced to 25 feet for steam railroad tracks and 18 feet for other tracks.

(4) When spans exceed 150 feet in length, additional clearance must be provided as given by order 1220-b.

(b) Clearances from Other Wires.

(1) The clear space between the lowest signal conductor, guy or messenger and the highest wire of a similar nature paralleling the track, shall be not less than two feet where the sum of the distances from the point of intersection to the nearest supporting structure of each span is 100 feet or less. Where the sum of these distances exceeds 100 feet and for crossings over supply wires, the requirements of order 1220-c and d must be met.

(2) The vertical clearance between conductors supported on the same pole or structure and at different levels shall in no case be less than 12 inches.

(c) Pole Clearances.

Unless physical conditions or municipal requirements prevent, the side clearances of poles shall be not less than 12 feet from the nearest track rail, except at sidings where clearance of not less than 7 feet is allowed. Where conductors of one pole line cross over or under conductors of a second line there shall, if practicable, be not less than 3 feet clearance between the conductors of the first line and any pole or tower of the second line, unless the conductors are attached thereto.

Order 1285. Crossings of Signal Lines Beneath Railways.

(a) Underground.

Underground signal lines crossing railways shall conform to the requirements of sections 120 and 129 and particularly to orders 1290 and 1295. Manholes, pull boxes and terminals shall be located away from the road bed. Conductors and cables carried underground under railways shall be placed in suitable ducts conforming to the requirements of section 129.

(b) Under Bridges.

Overhead signal lines passing beneath bridges over which railways pass shall conform to the general requirements of section 120, to the requirements for grade of construction of section 123, to the requirements for conductor clearances and separations of section 122, and to the special requirements for [illegible] and wiring arrangements of section 121.

Order 1286. Signal Lines Crossing over Trolley Contact Conductors (Where Grade D or E is not required).

(a) When Crossing Trolley Contact Conductors not Exceeding 750 Volts.

(1) Signal lines, except twisted-pair conductors and fire alarm conductors, (for which see orders 1283-d and 1288-b) carried over trolley-contact conductors of not more than 750 volts shall have conductor sizes not less than the following:

(a) No. 12 hard drawn copper or steel in spans less than 100 feet.

(b) No. 10 in spans of 100 to 125 feet.

(c) No. 9 in spans up to 150 feet.

(2) Sags shall not be less than those given in Table XIII for grade D. For spans longer than 150 feet the requirements of order 1246 for conductor sizes and of Appendix A for sags of grade C supply lines shall be complied with.

(3) Twisted pair conductors, unsupported by messangers, shall not be used in spans over 100 feet, if carried over trolley contact conductors unless each wire is hard drawn copper not less than No. 14 or tinned covered steel not less than No. 17, or its equivalent.

(4) The clearance of signal lines above contact conductors crossed over shall be in accordance with the values given in the tables of order 1220-c and d.

(b) When Crossing Trolley Contact Conductors Exceeding 750 Volts.

(1) For signal lines carried over trolley contact conductors of more than 750 volts to ground see order 1234.

(2) Twisted pair conductors may be used under the restrictions given in (a) above, but if in A or B construction, then shall have sags not less than those required by Appendix A for No. 8 hard drawn copper, and where supported by a messenger, the messenger shall have the sags required, in order [illegible]. Where supply line voltage exceeds 7500 volts the twisted pair shall always be supported by a messenger.

(3) The clearances of signal lines above the contact conductors crossed over shall be in accordance with the values given in the table of order 1220-c.

Order 1287. Signal Lines Crossing Over or Conflicting With Supply Lines of More Than 750 Volts.

(a) Strength of Construction.

Overhead signal lines crossing over supply lines under the circumstances noted in order 1231 shall comply with the construction requirements of grade A, B, or C as required in that order.

(b) Compliance with Other Orders.

Where signal lines crossing over supply lines are required to comply with grade A, B or C construction, they shall comply as to conductor sizes, materials, and sags, and as to materials and strength of supporting structures and attachments with section 124; as to separation and clearances of conductors and wires of the signal lines themselves with the requirements of section 122; as to guys and their insulators with the requirements of orders 1212 and 1213, and in general with the requirements of sections 120 and 121.

(c) Where Concerned Also with Railways.

Where the signal lines referred to in (a) above are required to comply with grade C construction and also cross over railways under circumstances calling for compliance with grade D or E construction, grade D or E shall be met in all respects except as to conductor sizes and sags, which shall comply with grade C.

(d) Pole Clearance.

The pole or tower structure of each line concerned in the crossover shall have clearance from the conductors of the other line as required by order 1221 or [illegible], whichever applies.

(e) Wire Clearance Above Supply Lines

The clear space between the lowest overhead signal line conductor (or [illegible] messenger, or span wire) and any supply line conductor or guy, span, or messenger wire which it crosses over shall not be less than given below, at 60 deg. F. with no wind, where the upper conductor or wire has fixed supports and the sum of the distances from the point of intersection to the nearest supporting structure of each span does not exceed 100 feet.

	Feet
Signal Lines.	
Above supply conductors of less than 7,500 volts	4
Above supply conductors 7,500 to 50,000 volts	6
Above supply service conductors (not exceeding 750 volts)	2
Above supply guy, messenger and span wires	2
[illegible] Span and Messenger Wires	
Above supply conductors of less than 750 volts	2
Above supply conductors 750 to 7,500 volts	4
Above supply conductors 7,500 to 50,000 volts	4

Exception: For crossings between conductors and guys, messenger or span wires on the same pole, see order 1221.

(f) Clearance Increases.

Clearance increases for long spans and high voltages are given in order [illegible].

(g) Falling Trees.

The crossover span and the next adjoining spans, shall as far as practicable be kept free from overhanging or decayed trees, which might fall [illegible] line.

(h) Special Longitudinal Requirements.

[illegible] requirements for longitudinal strength of cross-over supports [illegible] crossing over supply lines, where compliance with grade A or B [illegible] signal lines, see order 1249.

(i) Special Short Span Crossovers.

For special short span crossing construction, see order 1275.

(j) Guys.

Guys may be used to meet the strength requirements of section 124 and where used they and their insulators and guards shall conform to orders 1212 and 1213.

(k) Signal Lines Conflicting with Supply Lines.

Where signal lines are at higher levels and conflict with supply lines the requirements of (a) and (b) above apply in general to the conflicting signal lines just as they apply where the signal lines cross over the same supply lines.

Order 1288. Signal Lines Alone or (Concerned only With Other Signal Lines).

(a) Conductors for Fire Alarm Lines.

Conductors used for fire alarm circuits shall comply with the requirements of order 1253-d for Grade D for sizes and sags in spans up to 150 feet. For spans over 150 feet they shall have grade C sizes as given in order 1246 and sags not smaller than listed for grade C in Appendix A.

Exception: Where carried at higher levels than supply conductors in crossings, conflicts, or common use of poles, they shall comply with grades A, B or C construction requirements according to order 1234

(b) Conductors for Other Signal Lines

Conductors for signal lines other than fire-alarm lines unless crossing over railroads or crossing at higher levels or conflicting with, or on the same poles above supply (or trolley) lines, need not comply with any requirements as to size, material, or sag.

(c) Supporting Structures for Signal Lines.

The poles used for all signal lines, unless crossing over railways or [illegible] supply (or trolley) lines by crossing above, conflicting with, or carried above the supply lines on the same poles, need not comply with requirements as to strength and material except that poles and crossarms shall be of such initial size, and so guyed or braced where necessary as to withstand the vertical loads to which they may be subjected, including working on them.

In other respects all signal line supports shall comply with the general requirements of section 120 and 121 covering traffic guards, pole clearances and other matters.

(d) Clearances Above Ground.

Signal conductors alone and their guys, span wires, and messengers shall have clearances above streets, highways, alleys or generally accessible [illegible] along (and above) which the former pass, not less than the following at 60 deg. F. with no wind, when the spans do not exceed 150 feet:

Signal Lines, or Guy, Span or Messengers' Wires.	Feet
[illegible] other traveled roadways	24
[illegible] rural districts	15
[illegible] spaces or ways accessible only to pedestrians (if less [illegible])	12
A[illegible] residence garages	10

Exception: These clearances do not apply to guys not carried over roadways [illegible] one side of a street or alley, unless over driveways. For [illegible] right of way, or parallel to sidewalk curbs, when not [illegible] roadways, no clearance is required; and if passing [illegible] clearance may be reduced to 8 feet.

For signal [illegible] spans over 150 feet these clearances shall be increased [illegible] feet excess.

(e) Clearances from Other Signal Lines.

Signal conductors and their guys, span or messenger lines concerned in crossings, conflicts, or common use of poles with other signal lines only, shall have a minimum of 2 feet clearance from those of other lines.

Exceptions: Except for fire alarm lines this may be reduced where [illegible] one set of conductors is for public use and the other is used in the operation of supply lines.

(f) Grounding, Isolation, or Protection.

Signal lines, including fire-alarm lines, if at any point in their course [illegible] supply (or trolley) lines of more than 400 volts to ground, shall [illegible] station for public use by one of the methods specified in section 139. These lines shall elsewhere be isolated by elevation or guarded so as to be inaccessible to the public.

[illegible] lines used in the operation of supply lines shall be at all [illegible] elevation or otherwise guarded so as to be inaccessible to [illegible]

[illegible] sheathed cables and messengers shall be isolated or grounded [illegible] the general requirements of section 120.

Order 1289. Signal Lines Used Exclusively in the Operation of Supply Lines.

(a) Under Other Lines.

[illegible] with them, or [illegible] poles and below, high voltage direct current trolley [illegible] supply lines in the operation of which they are used, may [illegible] ordinary signal lines,

[illegible] These signal lines do not cross over or conflict with, and are not on [illegible] and higher than other lines or equipment and [illegible] signal lines and connected equipment are adequately guarded [illegible] authorized persons and [illegible] of section 139 have been taken.

Exceptions: If the supply lines concerned above are not required by the [illegible] to comply with the requirements of section 125 and 127 [illegible] construction, but the conductors shall be not smaller than [illegible] order 1246-b.

(b) Over Other Lines.

Such signal lines, if crossing over, conflicting with or higher on common poles with other lines or equipment shall comply with all the requirements for the highest voltage supply lines of not more than 7500 volts with which the signal lines may come in contact, except as to wire sizes for grade C for which see order 1283-d. If however, the signal lines are protected by fuseless lightning arresters, drainage coils, or other suitable protective devices to prevent the signal line voltage from normally exceeding 400 volts to ground, they may be run as ordinary signal lines. The method used shall be consistently adhered to throughout the extent of the entire system.

SECTION 129. UNDERGROUND LINES—MANHOLES, HANDHOLES, SPACING CHAMBERS AND DUCTS, CONDUCTORS AND EQUIPMENT.

Order 1290. Location and Accessibility of Conduits and Manholes.

(a) Covers.

(a) General Location.

Underground systems of electrical conductors shall be so located as to be subject to the least practicable amount of disturbance.

(b) Ducts.

To facilitate installing and withdrawing cables and conductors, the ducts between adjacent manholes or other outlets shall in general be installed in straight lines. When it is necessary to install curves, they shall be of the greatest practicable radius, and the spacing between adjacent manholes shall be correspondingly reduced.

(c) Manholes.

Manholes shall, where practicable, be so located as to provide convenient access and, if possible, so that the least horizontal distance from any rail of a railroad track to the nearest edge of a manhole opening is not less than 3 feet.

Order 1291. Grading of Ducts.

Manholes or handholes shall when practicable be so located and ducts so graded that drainage of ducts will always be toward manholes or handholes. To insure satisfactory drainage, the ducts shall be so installed as to provide, where practicable, a grade of not less than 3 inches in 100 feet of length.

Order 1292. Mechancial Details of Manholes.

(a) Minimum Strength.

The mechancial design and construction of manholes and handholes shall be such as to provide sufficient strength to safely sustain with a suitable margin of safety the mechanical loads which reasonably may be expected to be imposed upon them.

(b) Entrance.

The entrance to all manholes shall be not less than 24 inches minimum diameter. Round openings are recommended.

(c) Dimensions.

Manholes shall be so constructed, when practicable, that the least inside horizontal dimensions will be not less than 3 feet 6 inches and shall be so arranged as to maintain, if practicable, a clear working space not less than 3 feet horizontally and 6 feet vertically.

Exception: When side walls of the manhole are within one foot of the edge of the opening the depth may be less.

(d) Drainage and Ventilation.

(1) Where surface or ground water is liable to enter manholes containing supply conductors, these shall be so arranged, if practicable, as to provide permanent drainage.

(2) Where drainage is into sewers, suitable traps shall be arranged to prevent entrance of sewer gas into manholes.

(3) Manholes shall have adequate ventilation to open air where any opening exists from such chambers into subways entered by the public, as with some subway conduit systems, or where other conditions are such as to make ventilation necessary.

Order 1293. Manhole Covers and Guards.

(a) Cover.

Manholes and handholes, while not being worked in, shall be securely closed by covers of sufficient strength to sustain such mechancial loads as may reasonably be expected to be imposed upon them, and the arrangement shall be such that a tool or appliance is required for their opening or removal.

(b) Barriers or Guards.

Manhole openings shall be so arranged that when they are uncovered barriers or other suitable guards may be placed to effectively guard the opening.

Order 1294. Material, Size, and Finish of Ducts.

Ducts used in underground systems of distribution for electrical supply and signal conductors shall be of such material, size, mechanical strength, and finish as to facilitate the installation and maintenance of conductors or cables.

Order 1295. Installation of Conduits.

(a) Protection.

Ducts shall be suitably reinforced or be laid on suitable foundations of sufficient mechanical strength where necessary to protect them from settling and shall be protected by concrete or other covering where necessary to prevent their disturbance by workmen when digging or by other causes. The distance between the top of the conduit covering and the pavement surface or other surfaces under which the duct run is constructed shall be sufficient to protect the conduit from injury, and shall generally be at least 30 inches to the underside of track rails beneath which conduit passes.

(b) Smooth Surfaces.

Ducts shall have clear bores and be freed from burrs before laying. They shall be laid in line in such manner as to prevent inside shoulders at joints.

(c) Termination in Manhole.

Iron pipe conduit terminating in manholes, handholes, or other permanent openings of underground systems shall be provided with an effective bushing or other smooth outlet.

(d) Clearances.

Duct runs should provide as great a clearance from other underground structures as practicable and particularly from gas lines paralleling them.

(e) Walls Between Supply and Signal Conduits.

Conduits for underground conduit system to be occupied by signal conductors for public use shall, where practicable, be separated from underground conduit systems for supply conductors by not less than 3 inches of concrete or its equivalent.

Exception: Cable extensions may, however, be made to existing interconnected or jointly owned and jointly occupied duct systems used in common by municipalities, signal and power companies, with less effective separations than above specified.

(f) Supply and Signal Conduits Entering Manholes.

Where signal conductors (for public use) and supply conductors occupy ducts terminating in the same manhole, the two classes of duct shall be separated as widely as practicable, and where practicable, shall enter the manhole at opposite sides, so that cables can be racked along side walls with a minimum of crosses between the two classes of conductor.

(g) Joints.

Joints in duct runs shall be made mechanically secure to maintain individual ducts in alignment.

(h) Openings Into Manholes.

Duct openings into manholes or handholes shall where practicable, have a clearance above the floor or below the roof line of not less than six inches

(i) Laterals.

Ducts of laterals supplying service to buildings shall be effectively plugged at the entrance of building or cemented by the use of asphaltum, pitch, or other suitable means.

(j) Dissipation of Heat.

Conduits designed to carry supply cables of large current capacity shall be arranged, where practicable, so that no ducts necessarily dissipate heat solely through adjacent ducts.

Order 1296. Location and Identification of Conductors.

(a) Separation of Supply and Signal Systems.

Underground systems of electrical supply conductors and of signal conductors for public use shall in general be maintained in separate conduits and manholes.

Exception: Cable extensions to existing interconnected or jointly owned and jointly occupied duct systems in common by municipalities, signal companies, and power companies are exempted from the above.

(b) Identification.

Cables shall be permanently identified by tags or otherwise at each manhole, handhole, or other permanent opening of the underground system, except where their position, in conjunction with diagram supplied to workmen, gives sufficient identification.

(c) Accessibility.

Cables in manholes shall be reasonably accessible from the clear working space at all times. When cables cross by or over other cables, sufficient clearance shall be provided between them to permit reasonable access to any cable for inspection and repair and to prevent abrasion.

(d) Clearance in Manholes.

Each cable, where practicable, shall maintain a vertical clearance above the floor of any manhole of not less than 6 inches.

Order 1297. Mechancial Protection, Support, and Guarding of Live Parts.

(a) Cable Sheath.

Cables, unless rubber insulated, shall be provided with a water tight metal sheath or other water proof covering over their insulating coverings, except when used as ground connections or neutrals. Where closely grouped lead covered cables include cables operating at more than 7500 volts, they shall have suitable fire-resistive coverings to prevent damage from arcing.

(b) Guarding of Live Parts.

Protective, control, or other apparatus on supply lines where installed and maintained in manholes and handholes shall have live parts inclosed in suitable cases. The metal sheathing of all conductors or cables shall be made mechanically and electrically continuous with the metal cases of protective, control or other apparatus.

Joints or terminals of conductors or cables of underground systems of electrical supply shall be so arranged that there are no bare undergrounded current carrying metal parts exposed to accidental contact within manholes or handholes.

(c) Supports.

Mechancial support shall be provided for all cables at each manhole, handhole or other permanent opening.

(d) Underground Risers.

Conductors or cables from underground systems which connect to overhead systems shall be mechanically protected by installing them in grounded metal conduit or, in the case of signal cable or metal sheathed cable, in other substantial conduit, and shall terminate in suitable potheads or similar devices of approved design or construction; the open supply wiring connecting to the underground system shall begin not less than 10 feet above the ground surface or platform accessible to the public.

Order 1298. Spacing of Cables.

(a) Different Voltages.

Cables shall be so arranged and supported in ducts and manholes that those of higher operating voltages are separated from those of lower voltages as far as practicable.

(b) Different Systems.

Cables belonging to different systems, (particularly supply distribution and signal systems) shall not be run in the same duct.

Order 1299. Multiple Connections.

When transformers, regulators, or other similar apparatus operate in multiple, special tags or other suitable means shall be used to indicate that fact.

APPENDICES OF PART 2

APPENDIX A. LOADING DATA, MECHANICAL CHARACTERISTICS, AND RECOMMENDED NORMAL SAGS OF OVERHEAD LINE CONDUCTORS

I. RECOMMENDED SAGS, WITH CORRESPONDING TENSIONS AND STRESSES OF COPPER LINE CONDUCTORS

While the following sags are those generally recommended, circumstances will sometimes call for modifications. For instance, where many large conductors are carried by a pole line, greater sags than those listed for the larger conductors will sometimes be advisable, to reduce the stresses on poles at turns and dead ends, and to permit smaller longitudinal guying at cross overs where such guying is called for by the orders. (See order 1249).

The figures given for the sags and tensions have been rounded off to the nearest value which can be readily measured by methods and instruments in practical use for this purpose.

TABLE 15—SAGS FOR HARD AND MEDIUM-DRAWN BARE COPPER WIRE FOR DIFFERENT SPAN LENGTHS.
(At 30°, 60° and 90° F., wires without load)

Size A. W. G.	Grade of Constr.	Temp. Deg. F.	Sags: Span Lengths—Feet: 100	125	150	175	200	250	300	400	500
			In.	In.	In.	In.	In.	In.	In.	In.	In.
No. 8	C	30	5	11	22	...	...	...	...	...	...
		60	12	18	27	...	...	...	...	...	...
		90	16	22	32	...	...	...	...	...	...
No. 6	A	30	8	11	22	...	...	...	...	...	...
		60	12	18	27	...	...	...	...	...	...
		90	16	22	32	...	...	...	...	...	...
	B	30	6	10.5	16	...	...	...	...	...	...
		60	10	15	22	...	...	...	...	...	...
		90	14	19.5	27	...	...	...	...	...	...
	C	30	6	10.5	16	28	...	...	...	...	...
		60	10	15	22	33	...	...	...	...	...
		90	14	19.5	27	39	...	...	...	...	...
No. 4	All	30	6	10.5	16	22	32	64	109	...	...
		60	10	15	21	28	38	71	115	...	...
		90	14	19.5	26.5	34	46	77	120	...	...
No. 2	All	30	6	10.5	13	16	18.5	35	59	129	213
		60	10	15	18	21	24	44	68	137	226
		90	14	19.5	23.5	28	31	51	75	144	234
No. 1	All	30	6	10.5	13	16	18.5	32	51	113	195
		60	10	15	18	21	24	40	59	120	203
		90	14	19.5	23.5	28	31	47	67	130	212
No. 0	All	30	6	10.5	13	16	18.5	31	45	100	170
		60	10	15	18	21	24	28	55	110	180
		90	14	19.5	23.5	28	31	46	63	120	190
No. 00	All	30	6	10.5	13	16	18.5	29	42	92	157
		60	10	15	18	21	24	36	50	102	168
		90	14	19.5	23.5	28	31	44	58	111	179
No. 0000	All	30	6	10.5	13	16	18.5	26	34	73	118
		60	10	15	18	21	24	32	42	84	132
		90	14	19.5	23.5	28	31	40	50	94	142

TABLE 16—SAGS FOR HARD AND MEDIUM-DRAWN COVERED COPPER WIRE FOR DIFFERENT SPAN LENGTHS
(At 30°, 60° and 90° F., wires without load)

Size A. W. G.	Grade of Constr.	Temp. Deg. F.	Sags: Span Length—Feet: 100	125	150	175	200	250	300
			In.	In.	In.	In.	In.	In.	In.
No. 8	C	30	15	23	36	...	...	...	...
		60	18	27	40	...	...	...	...
		90	21.5	31	44	...	...	...	...
No. 6	A	30	15	23	36	...	...	...	...
		60	18	27	40	...	...	...	...
		90	21.5	31	45	...	...	...	...
No. 6	B	30	11	17.5	27	...	...	...	...
		60	15	22	33	...	...	...	...
		90	18	26	38	...	...	...	...
No. 6	C	30	8.5	14	22	31	...	...	...
		60	12	18	27	36	...	...	...
		90	15.5	22.5	32	40	...	...	...
No. 4	All	30	8.5	14	21.5	31	43	...	...
		60	12	18	27	36	48	...	...
		90	17	22.5	32	41	54	...	...
No. 2	All	30	8.5	14	21.5	23.5	30	53	89
		60	12	18	27	30	36	60	96
		90	17	22.5	32	35	42	67	103
No. 1	All	30	8.5	13.5	21	23	27	44	72
		60	12	18	26	29	33	52	80
		90	15.5	22.5	31	34	39	59	87
No. 0	All	30	8.5	13.5	20.5	22.5	26	42	66
		60	12	18	26	28	32	49	72
		90	15.5	22.5	31	34	38	56	82
No. 00	All	30	8.5	13.5	20	22.5	25	38	57
		60	12	18	25	28	31	46	66
		90	16	22.5	30	34	38	53	73
No. 0000	All	30	8.5	13.5	18.5	21	24.5	31	43
		60	12	18	24	27	30	38	50
		90	16	22.5	29	33	36	46	59

TABLE 17—SAGS FOR SOFT-DRAWN COVERED COPPER WIRES FOR DIFFERENT SPAN LENGTHS.
(At 30°, 60° and 90° F., wires without load)

Size A. W. G.	Grade of Constr.	Temp. Deg. F.	Sags: Span Length—Feet: 100	125	150	175	200
			In.	In.	In.	In.	In.
No. 6	C	30	18	28	44	.....	.....
		60	21	32	48	.....	.....
		90	24	36	51	.....	.....
No. 4	A	30	17.5	28	45	.....	.....
		60	21	32	48	.....	.....
		90	24	35	51	.....	.....
No. 4	B & C	30	14.5	23	36	.....	.....
		60	18	27	40	.....	.....
		90	21.5	31	44	.....	.....
No. 2	A	30	14.5	23	35	49	.....
		60	18	27	40	54	.....
		90	21.5	31	44	58	.....
No. 2	B & C	30	11	17.5	25	40	55
		60	15	22	33	45	60
		90	18.5	26	38	50	64
No. 1	A	30	10.5	17.5	23	40	55
		60	15	22	33	45	60
		90	18.5	26	37	50	65
No. 1	B & C	30	8.5	13.5	21.5	31	43
		60	12	18	27	37	45
		90	15.5	22.5	32	42	53
No. 0	All	30	8.5	13.5	20.5	29	39
		60	12	18	25	35	45
		90	15.5	22.5	31	38	51
No. 00	All	30	8.5	13.5	20.5	25	36
		60	12	18	25	33	42
		90	15.5	22.5	30	38	48
No. 0000	All	30	8.5	13.5	18.5	24.5	30
		60	12.0	18	24	30	36
		90	16	22.5	29	36	42

TABLE 18—TENSIONS IN HARD AND MEDIUM-DRAWN BARE COPPER WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size A. W. G.	Grade of Constr.	Conditions of Load	Tensions: Span Length—Feet: 100	125	150	175	200	250	300	400	500
		°F.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 8	C	30° No load	94	92	76	....	....	....	....	....	....
		60° " "	63	65	62	....	....	....	....	....	....
		90° " "	47	53	54	....	....	....	....	....	....
		0° Loaded	442	503	520	....	....	....	....	....	....
No. 6	A	30° No load	150	145	120	....	....	....	....	....	....
		60° " "	99	105	99	....	....	....	....	....	....
		90° " "	74	85	86	....	....	....	....	....	....
		0° Loaded	570	630	670	....	....	....	....	....	....
No. 6	B	30° No load	180	180	165	....	....	....	....	....	....
		60° " "	120	125	120	....	....	....	....	....	....
		90° " "	84	95	100	....	....	....	....	....	....
		0° Loaded	590	650	710	....	....	....	....	....	....
No. 6	C	30° No load	180	180	165	125	....	....	....	....	....
		60° " "	120	125	120	110	....	....	....	....	....
		90° " "	84	95	100	96	....	....	....	....	....
		0° Loaded	590	650	710	740	....	....	....	....	....
No. 4	All	30° No load	290	280	270	260	240	185	160	....	....
		60° " "	190	200	200	210	200	170	150	....	....
		90° " "	135	150	160	175	170	155	145	....	....
		0° Loaded	740	840	900	960	1,000	1,000	990	....	....
No. 2	All	30° No load	460	450	510	590	650	540	470	380	350
		60° " "	300	310	350	440	500	430	400	350	340
		90° " "	210	240	290	340	400	370	270	340	330
		0° Loaded	1,000	1,100	1,250	1,350	1,450	1,550	1,550	1,600	1,600
No. 1	All	30° No load	580	520	650	740	820	730	610	540	490
		60° " "	380	400	470	550	630	600	550	510	470
		90° " "	270	300	370	430	500	500	520	480	450
		0° Loaded	1,200	1,250	1,450	1,600	1,700	1,500	1,900	1,200	1,900
No. 0	All	30° No load	780	720	820	930	1,050	970	950	760	710
		60° " "	480	500	600	700	800	790	790	710	670
		90° " "	340	380	460	540	630	660	690	630	620
		0° Loaded	1,400	1,500	1,650	1,850	2,000	2,150	2,200	2,300	2,250
No. 00	All	30° No load	920	910	1,050	1,150	1,300	1,300	1,300	1,050	960
		60° " "	600	630	750	880	1,000	1,050	1,100	950	910
		90° " "	430	450	550	680	790	850	930	880	850
		0° Loaded	1,700	1,750	1,950	2,150	2,350	2,350	2,900	2,650	2,650
No. 0000	All	30° No load	1,450	1,450	1,650	1,850	2,050	2,300	2,500	2,100	2,000
		60° " "	960	1,000	1,200	1,400	1,600	1,850	2,050	1,850	1,650
		90° " "	680	770	930	1,100	1,250	1,500	1,700	1,650	1,700
		0° Loaded	2,500	2,500	2,800	3,100	3,350	3,750	4,100	4,000	4,150

(a) Correspond to the sags of Table 15.

TABLE 19—TENSIONS IN HARD AND MEDIUM-DRAWN COVERED COPPER WIRE DIFFERENT SPAN LENGTHS (a)

Size A. W. G.	Grade of Constr.	Condition of Load	Tensions: Span Length—Feet: 100	125	150	175	200	250	300
		°F.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 8	C	30° No load	77	77	72	....	....	....	....
		60° " "	62	65	63	....	....	....	....
		90° " "	54	58	59	....	....	....	....
		0° Loaded	470	520	560	....	....	....	....
No. 6	A	30° No load	115	115	105	....	....	....	....
		60° " "	94	98	95	....	....	....	....
		90° " "	81	87	87	....	....	....	....
		0° Loaded	580	640	670	....	....	....	....
No. 6	B	30° No load	155	155	155	....	....	....	....
		60° " "	110	120	115	....	....	....	....
		90° " "	94	105	105	....	....	....	....
		0° Loaded	600	680	720	....	....	....	....
No. 6	C	30° No load	195	190	170	165	....	....	....
		60° " "	140	145	140	145	....	....	....
		90° " "	103	120	120	130	....	....	....
		0° Loaded	640	710	760	820	....	....	....
No. 4	All	30° No load	270	250	260	240	230	....	....
		60° " "	210	210	210	210	210	....	....
		90° " "	155	170	175	185	185	....	....
		0° Loaded	820	900	950	1,000	1,050	....	....
No. 2	All	30° No load	430	440	410	500	530	460	400
		60° " "	330	340	330	400	430	415	370
		90° " "	250	270	250	340	380	370	320
		0° Loaded	1,100	1,150	1,200	1,350	1,500	1,350	1,500
No. 1	All	30° No load	560	540	510	630	710	650	590
		60° " "	400	410	410	500	570	570	540
		90° " "	310	330	350	430	490	510	490
		0° Loaded	1,200	1,300	1,350	1,550	1,700	1,700	1,550
No. 0	All	30° No load	710	690	670	820	930	910	870
		60° " "	510	530	530	660	750	780	770
		90° " "	390	430	450	550	630	680	650
		0° Loaded	1,450	1,550	1,600	1,850	2,000	2,050	2,200
No. 00	All	30° No load	890	860	840	1,000	1,200	1,200	1,200
		60° " "	630	650	680	680	970	1,000	1,050
		90° " "	450	520	570	680	810	890	910
		0° Loaded	1,700	1,300	1,850	2,100	2,350	2,500	2,600
No. 0000	All	30° No load	1,350	1,350	1,400	1,650	1,850	2,250	2,450
		60° " "	960	1,000	1,100	1,200	1,550	1,900	2,050
		90° " "	730	810	920	1,100	1,300	1,600	1,750
		0° Loaded	2,450	2,500	2,650	3,000	3,300	3,350	4,300

(a) Correspond to Sags of Table 16.

TABLE 20—TENSIONS IN SOFT-DRAWN COVERERD COPPER WIRE FOR DIFFERERENT SPAN LENGTHS (a)

Size A. W. G.	Grade of Constr.	Condition of Load	Tensions: Span Length—Feet: 100	125	150	175	200
		°F.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 6	C	30° No load	97	94	87	....	....
		60° " "	82	85	80	....	....
		90° " "	71	76	75	....	....
		0° Loaded	540	590	610	....	....
No. 4	A	30° No load	140	140	125	....	....
		60° " "	120	120	115	....	....
		90° " "	105	115	110	....	....
		0° Loaded	670	710	720	....	....
No. 4	B & C	30° No load	175	165	155	....	....
		60° " "	140	145	140	....	....
		90° " "	115	130	130	....	....
		0° Loaded	720	770	800	....	....
No. 2	A	30° No load	280	270	250	240	....
		60° " "	220	230	220	225	....
		90° " "	185	200	200	210	....
		0° Loaded	960	970	970	1,050	....
No. 2	B & C	30° No load	350	350	310	300	230
		60° " "	260	260	270	270	250
		90° " "	210	240	240	240	240
		0° Loaded	960	1,050	1,100	1,100	1,150
No. 1	A	30° No load	430	430	380	370	350
		60° " "	320	340	330	330	320
		90° " "	260	290	290	300	300
		0° Loaded	1,100	1,200	1,200	1,250	1,250
No. 1	B & C	30° No load	560	540	430	470	450
		60° " "	390	410	400	400	400
		90° " "	310	330	340	350	350
		0° Loaded	1,250	1,300	1,350	1,400	1,450
No. 0	All	30° No load	710	690	670	630	630
		60° " "	510	530	530	530	540
		90° " "	460	480	450	450	480
		0° Loaded	1,450	1,550	1,600	1,500	1,700
No. 00	All	30° No load	890	860	850	840	840
		60° " "	630	650	680	700	720
		90° " "	490	520	570	600	640
		0° Loaded	1,700	1,800	1,850	1,900	2,000
No. 0000	All	30° No load	1,350	1,350	1,400	1,450	1,550
		60° " "	960	1,000	1,100	1,200	1,300
		90° " "	730	810	900	1,000	1,100
		0° Loaded	2,400	2,500	2,600	2,750	3,000

(a) Correspond to sags of Table 17.

TABLE 21—STRESSES IN HARD AND MEDIUM-DRAWN BARE COPPER WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size A.W.G.	Grade of Constr.	Conditon of Load	Stresses: Span Length—Feet: 100	125	150	175	200	250	300	400	500
		°F.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.	Lbs. Sq. In.
No. 8	C	30° No load	7,200	7,150	5,900	....	....	....	....	....	....
		60° " "	4,800	5,000	4,800	....	....	....	....	....	....
		90° " "	3,600	4,100	4,150	....	....	....	....	....	....
		0° Loaded	34,100	38,600	40,250	....	....	....	....	....	....
No. 6	A	30° No load	7,200	7,150	5,900	....	....	....	....	....	....
		60° " "	4,800	5,000	4,800	....	....	....	....	....	....
		90° " "	3,600	4,100	4,150	....	....	....	....	....	....
		0° Loaded	27,400	30,500	32,350	....	....	....	....	....	....
No. 6	B	30° No load	8,800	8,700	8,000	....	....	....	....	....	....
		60° " "	5,800	6,000	5,900	....	....	....	....	....	....
		90° " "	4,100	4,650	4,850	....	....	....	....	....	....
		0° Loaded	25,400	31,750	34,400	....	....	....	....	....	....
No. 6	C	30° No load	8,800	8,700	8,000	6,150	....	....	....	....	....
		60° " "	5,800	6,000	5,900	5,350	....	....	....	....	....
		90° " "	4,100	4,650	4,850	4,650	....	....	....	....	....
		0° Loaded	28,400	31,750	34,400	35,900	....	....	....	....	....
No. 4	All	30° No load	8,800	8,700	8,200	8,000	7,200	5,600	4,950	....	....
		60° " "	5,800	6,000	6,150	6,300	6,100	5,100	4,550	....	....
		90° " "	4,100	4,650	4,950	5,350	5,250	4,700	4,400	....	....
		0° Loaded	22,700	25,700	27,400	29,400	30,500	30,600	30,300	....	....
No. 2	All	30° No load	8,800	8,700	9,850	11,200	12,400	10,300	8,950	7,250	6,650
		60° " "	5,800	6,000	7,200	8,400	9,600	8,250	7,700	6,800	6,500
		90° " "	4,100	4,650	5,600	6,450	7,600	7,150	7,000	6,600	6,250
		0° Loaded	19,400	21,000	23,650	26,000	28,100	28,800	30,200	30,500	30,900
No. 1	All	30° No load	8,800	8,700	9,850	11,200	12,400	11,150	10,250	8,250	7,500
		60° " "	5,800	6,000	7,200	8,400	9,600	9,100	8,950	7,750	7,150
		90° " "	4,100	4,650	5,600	6,450	7,600	7,600	7,850	7,300	6,950
		0° Loaded	18,200	19,250	21,700	24,000	26,000	27,500	28,700	28,900	29,000
No. 0	All	30° No load	8,800	8,700	9,850	11,200	12,400	11,700	11,400	9,200	8,550
		60° " "	5,800	6,000	7,200	8,400	9,600	9,500	9,500	8,500	8,050
		90° " "	4,100	4,650	5,600	6,450	7,600	7,900	8,250	7,900	7,600
		0° Loaded	17,100	18,200	20,200	22,200	24,150	26,000	26,500	27,500	27,000
No. 00	All	30° No load	8,800	8,700	9,850	11,200	12,400	12,400	12,300	10,100	9,250
		60° " "	5,800	6,000	7,200	8,400	9,600	10,000	10,400	9,100	8,650
		90° " "	4,100	4,650	5,600	6,450	7,600	8,150	8,950	8,400	8,100
		0° Loaded	16,100	16,800	18,800	20,500	22,500	24,200	27,600	25,400	25,400
No. 0000	All	30° No load	8,800	8,700	9,850	11,200	12,400	13,850	15,100	12,550	12,150
		60° " "	5,800	6,000	7,200	8,400	9,600	11,250	12,250	11,050	11,050
		90° " "	4,100	4,650	5,600	6,450	7,600	9,050	10,350	9,850	10,150
		0° Loaded	15,000	15,100	16,900	18,600	20,100	22,700	24,600	24,000	[illegible]

(a) Correspond to the tensions of Table 18.

TABLE 22—STRESSES IN HARD AND MEDIUM-DRAWN COVERED COPPER WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size A. W. G	Grade of Constr.	Condition of Load	Stresses: Span Length—Feet: 100	125	150	175	200	250	300
		°F.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.
No. 8	C	30° No load	5,900	5,900	5,550	....	....	....	....
		60° " "	4,600	5,050	4,300	....	....	....	....
		90° " "	4,150	4,500	4,550	....	....	....	....
		0° Loaded	35,900	40,000	42,800	....	....	....	....
No. 6	A	30° No load	5,550	5,600	5,150	....	....	....	....
		60° " "	4,550	4,750	4,600	....	....	....	....
		90° " "	3,900	4,200	4,250	....	....	....	....
		0° Loaded	25,000	30,500	32,500	....	....	....	....
No. 6	B	30° No load	7,400	7,400	6,800	....	....	....	....
		60° " "	5,450	5,950	5,600	....	....	....	....
		90° " "	4,550	5,000	5,000	....	....	....	....
		0° Loaded	29,300	33,100	34,800	....	....	....	....
No. 6	C	30° No load	9,400	9,150	8,250	8,050	....	....	....
		60° " "	6,800	7,100	6,800	6,950	....	....	....
		90° " "	5,250	5,750	5,800	6,250	....	....	....
		0° Loaded	31,000	34,600	37,000	39,300	....	....	....
No. 4	All	30° No load	8,300	8,500	7,800	7,450	7,000	....	....
		60° " "	6,250	6,550	6,250	6,400	6,250	....	....
		90° " "	4,500	5,250	5,400	5,700	5,650	....	....
		0° Loaded	24,000	27,400	28,000	30,700	31,700	....	....
No. 2	All	30° No load	8,300	8,500	7,800	9,500	10,200	8,750	7,650
		60° " "	6,250	6,550	6,250	7,550	8,300	[illegible]	[illegible]
		90° " "	4,500	5,250	5,400	6,500	7,200	7,150	6,150
		0° Loaded	20,800	22,300	23,000	26,250	28,300	29,300	29,000
No. 1	All	30° No load	8,550	8,200	7,700	9,550	10,800	10,050	9,000
		60° " "	6,950	6,300	6,250	7,650	8,700	8,700	8,150
		90° " "	4,650	5,000	5,250	6,500	7,400	7,700	7,500
		0° Loaded	18,600	20,000	20,500	23,700	26,050	26,000	[illegible]
No. 0	All	30° No load	8,600	8,350	8,050	9,950	11,200	11,000	10,250
		60° " "	6,150	6,250	6,450	8,000	9,100	9,400	9,250
		90° " "	4,700	5,150	5,400	6,600	7,650	8,200	8,200
		0° Loaded	17,650	18,500	19,000	22,100	24,300	24,500	26,300
No. 00	All	30° No load	8,450	8,200	8,000	9,300	11,300	11,550	11,150
		60° " "	6,000	6,250	6,450	7,300	9,250	9,750	9,650
		90° " "	4,550	5,000	5,450	6,500	7,700	8,600	8,750
		0° Loaded	16,300	17,100	17,700	20,250	22,550	24,200	25,100
No. 0000	All	30° No load	8,150	8,000	8,500	9,300	11,200	12,650	14,600
		60° " "	5,800	6,050	6,600	7,300	9,250	11,350	12,450
		90° " "	4,400	4,850	5,500	6,500	7,700	9,550	10,550
		0° Loaded	14,650	15,000	15,200	17,900	19,950	22,260	25,250

(a) Correspond to the tensions of Table 19.

TABLE 23—STRESSES OF SOFT DRAWN COVERED COPPER WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size A. W. G.	Grade of Constr.	Condition of Load	Stresses: Span Length—Feet: 100	125	150	175	200
		°F.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.
No. 6	C	30° No load	4,700	4,550	4,250	....	....
		60° " "	3,950	4,100	3,900	....	....
		90° " "	3,400	3,700	3,650	....	....
		0° Loaded	26,250	28,650	29,500	....	....
No. 4	A	30° No load	4,350	4,250	3,850	....	....
		60° " "	3,600	3,750	3,550	....	....
		90° " "	3,150	3,450	3,300	....	....
		0° Loaded	20,400	21,600	22,060	....	....
No. 4	B & C	30° No load	5,200	5,100	4,750	....	....
		60° " "	4,200	4,400	4,300	....	....
		90° " "	3,550	3,900	3,900	....	....
		0° Loaded	21,850	23,500	24,300	....	....
No. 2	A	30° No load	5,300	5,100	4,750	4,700	....
		60° " "	4,200	4,400	4,500	4,200	....
		90° " "	3,550	3,850	3,900	4,000	....
		0° Loaded	17,200	18,500	18,650	19,500	....
No. 2	B & C	30° No load	6,650	6,700	6,000	5,700	5,500
		60° " "	5,050	5,350	5,150	5,150	5,000
		90° " "	4,050	4,500	4,550	4,700	4,700
		0° Loaded	18,750	20,300	20,900	21,500	21,750
No. 1	A	30° No load	6,500	6,500	5,800	5,550	5,300
		60° " "	4,800	5,150	4,950	4,900	4,800
		90° " "	3,900	4,400	4,400	4,500	4,500
		0° Loaded	17,050	18,400	18,550	18,850	19,050
No. 1	B & C	30° No load	8,550	8,200	7,500	7,050	6,650
		60° " "	6,000	6,250	6,050	6,000	6,000
		90° " "	4,650	5,000	5,200	5,300	5,500
		0° Loaded	18,800	20,100	20,500	21,200	21,200
No. 0	All	30° No load	8,600	8,350	8,050	7,650	7,500
		60° " "	6,150	6,350	6,450	6,400	6,500
		90° " "	4,700	5,150	5,400	5,750	5,900
		0° Loaded	17,650	18,500	19,000	19,600	20,250
No. 00	All	30° No load	8,500	8,200	8,100	8,000	8,000
		60° " "	6,000	6,250	6,500	6,550	6,550
		90° " "	4,650	5,000	5,450	5,750	6,100
		0° Loaded	16,400	17,000	17,750	18,200	19,000
No. 0000	All	30° No load	8,150	8,100	8,250	8,700	9,250
		60° " "	5,750	6,100	6,550	7,150	7,650
		90° " "	4,400	4,850	5,450	6,000	6,350
		0° Loaded	14,450	15,000	15,700	16,500	18,000

(a) Correspond to the tensions of Table 20.

2. MINIMUM SAGS WITH CORRESPONDING TENSIONS OF IRON AND STEEL WIRE.

The following sags are those which will stress the conductor to nine-tenths of its elastic limit under the loading conditions specified in order 1241.

This method has been employed for determining steel-wire sags for the reason that steel wire is generally used in rural districts where the chance that conductors of other materials will be strung on the same supporting structures is very remote and where long spans are used for the sake of economy. It is important, therefore, to know the minimum sags that can be used without overstressing the conductor.

When short spans are used and there is every possibility that the steel wire will be replaced with copper or that copper circuits will be strung on the same supports, it is recommended that the sags for copper wire of the same or nearest cross section be used, unless the sags specified for steel wire are the greater, in which case the latter sags should be used for both the copper and steel conductors. This construction will eliminate a ragged appearance in the line and will also assist in preventing conductors from swinging together.

Under the assumed conditions, the tension in the conductor will be as great for short spans as for long ones. The longitudinal strength of the structures for such spans must, in order to withstand these stresses, be comparable to the strength of structures for long spans. The advantage of using short spans is accordingly lost unless the sags are increased.

Since the sags for iron and steel wire have been calculated on the basis of the material being stressed to nine-tenths of the average elastic limit or 0.45 of the ultimate strength, under loaded conditions, the values for the sags and tensions given in these tables are limiting values.

A series of tables of stresses is not included since the value under loaded conditions is always that given in the preceding paragraph. The stress under other conditions can be readily computed from the table of tensions.

TABLE 24—SAGS FOR EXTRA BEST BEST (E. B. B.) IRON WIRE FOR DIFFERENT SPAN LENGTHS
(At 30°, 60° and 90° F.—Wires Without Load)

Size of Wire	Temp. Deg. F.	Sags — Span Length—Feet										
		100	125	150	175	200	250	300	400	500	600	700
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
No. 8 Stl. W. G.	30	28.5	47.5	70.5	97	130	208	...	...	...	...	...
	60	31	43.5	71	90.5	132	209	...	...	...	...	...
	90	32.5	49.5	73	100	133	210	...	...	...	...	...
No. 6 Stl. W. G.	30	18	31.5	49	68.5	94.5	150	...	...	...	...	...
	60	21	34.5	51	72	97	152	...	...	...	...	...
	90	23.5	37	54	74.5	100	155	...	...	...	...	...
No. 4 Stl. W. G.	30	11	21.5	34.5	49.5	69	110	...	...	...	...	...
	60	14.5	25	37.5	53	71	112	...	...	...	...	...
	90	17.5	28.5	40.5	58	75.1	116	...	...	...	...	...
¼ in. 7 strand	30	7.8	17	30.5	46.5	64.5	109	162.5	305	...	...	...
	60	10.2	21	34	50.5	66	111.5	165.5	303	...	...	...
	90	13.5	24	37	53	71	116	168.5	310	...	...	...
5-16 in. 7 strand	30	3.8	7.2	13	22	38	61	95.5	183	300	444	...
	60	5.1	9.9	17	26.5	38	66	100	183	304	443	...
	90	7.4	13.5	21.5	31	42.5	70.5	105	193	308	453	...
⅜ in. 7 strand	30	3.9	7.0	11.7	19	27.5	51.5	81.5	158	258	383	534
	60	5.2	9.3	15.5	23	32.5	56.5	86.5	163	262	388	539
	90	7.1	12.5	19	27.5	37.5	61.5	91.5	168	267	398	543

TABLE 25—SAGS FOR BEST BEST (B. B.) IRON WIRES FOR DIFFERENT SPAN LENGTHS
(At 30°, 60° and 90° F.—Wires Without Load)

Size of Wire	Temp. Deg. F.	Sags — Span Length—Feet										
		100	125	150	175	200	250	300	400	500	600	700
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
No. 8 Stl. W. G.	30	23	40.5	59.5	84	112.5	161	...	...	...	...	...
	60	25	42	62	86.5	113	163	...	...	...	...	...
	90	27	45.5	63	87.5	115	164	...	...	...	...	...
No. 6 Stl. W. G.	30	13	25	40	58.5	78.5	129	...	...	...	...	...
	60	16	28.5	43.5	61.5	81.5	133	...	...	...	...	...
	90	19.5	31.5	46	65	84.5	136	...	...	...	...	...
No. 4 Stl. W. G.	30	7.5	16	27.5	41.5	56.5	94.5	...	...	...	...	...
	60	10.6	20	31	45	60	98	...	...	...	...	...
	90	14.5	23	34	49	63.5	102	...	...	...	...	...
¼ in. 7 strand	30	4.8	11.4	23	37	53.5	93	141	263	...	...	...
	60	6.7	15	27	41	57	96.5	144.5	271	...	...	...
	90	9.5	19	30	44.5	61	100	143	275	...	...	...
5-16 in. 7 strand	30	3.1	5.6	9.7	16.5	25.5	50.5	81.5	161	266	393	555
	60	4	7.4	13	21	30.5	55.5	87	166	271	403	550
	90	5.5	10	17	26.5	35.5	61	92	171	276	407	554
⅜ in. 7 strand	30	3.8	5.6	9.1	14.5	21.5	41.0	67.5	136	226	339	478
	60	4.6	7.2	11.6	18	26.0	47	73.5	142	232	344	479
	90	6.5	9.5	15.0	22.0	31.0	52	79	148	233	350	484

TABLE 26—SAGS FOR ORDINARY GRADE STEEL WIRES FOR DIFFERENT SPAN LENGTHS
(At 30°, 60° and 90° F.—Wires Without Load)

Size of Wire	Temp. Deg. F.	Sags — Span Length—Feet										
		100	125	150	175	200	250	300	400	500	600	700
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
No. 8 Stl. W. G.	30	21	37	55.5	79	104	169	249	...	...	...	...
	60	23	38.5	57.5	80	105	170	251	...	...	...	...
	90	25	40.5	59.5	82	107.5	173	251	...	...	...	...
No. 6 Stl. W. G.	30	11.4	23	37.5	54	73	122	179	...	...	...	...
	60	15	26.5	40.5	57	76.5	123	182	...	...	...	...
	90	18	30	44	60.5	79.5	127	135	...	...	...	...
No. 4 Stl. W. G.	30	6.4	14.5	25	38	52	38	132	...	...	...	...
	60	9.8	18.5	29	41	55.5	91.5	134	...	...	...	...
	90	13.5	22	33	45	60	95	138	...	...	...	...
¼ in. 7 strand	30	3.8	7.1	16.5	26.5	41	75.5	117	225	362	...	...
	60	4.5	9.3	21	31	45.5	79.5	121	230	360	...	...
	90	6.4	13.5	25	35.5	49.5	83.5	125	233	370	...	...
5-16 in. 7 strand	30	2.6	4.6	7.7	11.5	19.5	40	68	147.5	232	348	457
	60	3.4	6	10.1	15	24.5	45.5	74	152	237	353	492
	90	4.6	7	13.5	19.5	20	52	80	156	243	359	497
⅜ in. 7 strand	30	2.6	4.3	6.6	9.9	14.5	28.0	48.0	105.0	180	272	283
	60	4.4	5.3	8.3	12.5	18	33.0	55.0	112	187	279	390
	90	4.0	6.8	10.7	16	22.5	39.5	61.0	118.5	193	285	397

TABLE 27—SAGS FOR SIEMENS-MARTIN STEEL WIRES FOR DIFFERENT SPAN LENGTHS
(At 30°, 60° and 90° F.—Wires Without Load)

Size of Wire	Temp. Deg. F.	Sags — Span Length—Feet											
		100	125	150	175	200	250	300	400	500	600	700	1000
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
No. 8 Stl. W. G.	30	5.5	17	31.5	49	67.0	113	170	317	...	...	...	...
	60	9.1	20	34.5	51.0	70	118	172.5	320	...	...	...	...
	90	12.7	24	33	54	73	117	175	325	...	...	...	...
No. 6 Stl. W. G.	30	5.3	7.3	16	28	48	77.5	119.0	230	...	...	...	...
	60	5.2	10.7	20.5	32	47.5	81.0	123	233	...	...	...	...
	90	7.7	15	25	38.5	51.5	85.5	127	238	...	...	...	...
No. 4 Stl. W. G.	30	2.4	4.6	8.5	15.0	25.0	50	82	164	...	...	...	...
	60	3.5	6.5	12	20	30	55.5	86.5	168	...	...	...	...
	90	5.0	9.6	16.5	25.5	35.5	61.5	91.5	173	...	...	...	...
¼ in. 7 strand	30	1.9	3.3	5.4	8.9	15	37.0	69.5	152	258	392	...	...
	60	2.2	3.4	5.7	11.4	19	43.5	74.5	158	264	397	...	...
	90	2.7	5	8.6	15	24	49	81	164	264	402	...	...
5-16 in. 7 strand	30	1.8	3	4.8	6.8	9.7	19	36	89	162	252	360	...
	60	2.2	3.6	5.6	8.2	12	23.5	42.5	97.5	170	260	367	...
	90	2.7	4.5	7.0	10.4	15	29	49.5	105	177	267	374	...
⅜ in. 7 strand	30	1.7	2.7	4	5.6	7.5	13	21.5	50	99	165	245	564
	60	1.9	3.1	4.6	6.5	8.8	15.5	25	57.5	109	175	254	574
	90	2.2	3.6	5.4	7.8	10.5	18.5	29.5	65.5	118	184	264	583

TABLE 28—TENSIONS FOR EXTRA BEST BEST (E. B. B.) IRON WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size Stl. W. G.	Conditions of load and Temp. F.	Tensions — Span Length—Feet										
		100	125	150	175	200	250	300	400	500	600	700
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 8	30° No load	37	36	35	34	34	34	...	...	...	...	...
	60° " "	35	35	34	34	34	33	...	...	...	...	...
	90° " "	34	33	33	33	33	33	...	...	...	...	...
	0° Loaded	422	422	422	422	422	422	...	...	...	...	...
No. 6	30° No load	86	75	70	67	65	64	...	...	...	...	...
	60° " "	72	69	66	65	64	63	...	...	...	...	...
	90° " "	64	64	64	63	63	62	...	...	...	...	...
	0° Loaded	592	592	592	592	592	592	...	...	...	...	...
No. 4	30° No load	188	149	134	127	122	118	...	...	...	...	...
	60° " "	144	132	123	120	118	115	...	...	...	...	...
	90° " "	118	117	115	114	113	112	...	...	...	...	...
	0° Loaded	813	818	818	813	818	818	...	...	...	...	...
¼ in. 7 strand	30° No load	258	160	138	124	119	109	160	102	...	...	...
	60° " "	153	141	124	116	113	106	104	101	...	...	...
	90° " "	140	122	114	109	107	104	102	101	...	...	...
	0° Loaded	810	810	810	810	810	810	810	810	...	...	...
5-16 in 7 strand	30° No load	832	683	541	440	380	323	299	278	268	265	...
	60° " "	611	499	413	364	332	300	285	272	265	262	...
	90° " "	426	368	332	310	296	290	272	266	262	260	...
	0° Loaded	1,394	1,394	1,394	1,394	1,394	1,394	1,894	1,394	1,394	1,394	...
⅜ in. 7 strand	30° No load	1,134	984	849	725	642	540	492	452	437	427	422
	60° " "	863	747	658	592	544	401	483	438	429	422	413
	90° " "	625	560	523	494	475	451	433	428	421	417	415
	0° Loaded	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711

(a) Correspond to the sags of Table 24.

TABLE 29—TENSIONS FOR BEST BEST (B. B.) IRON WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size Stl. W. G.	Conditions of 60° " " Temp. F.	Tensions — Span Length—Feet										
		100	125	150	175	200	250	300	400	500	600	700
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 8 Stl. W. G.	30° No load	46	42	41	40	39	38	...	...	...	...	...
	60° " "	43	41	40	39	39	38	...	...	...	...	...
	90° " "	40	39	38	38	38	38	...	...	...	...	...
	0° Loaded	474	474	474	474	474	474	...	...	...	...	...
No. 6 Stl. W. G.	30° No load	114	93	84	80	77	73	...	...	...	...	...
	60° " "	92	83	78	75	74	72	...	...	...	...	...
	90° " "	79	76	74	73	72	72	...	...	...	...	...
	0° Loaded	665	665	665	665	665	665	...	...	...	...	...
No. 4 of Wire	30° No load	276	200	168	154	147	137	...	...	...	...	...
	load and	193	166	149	142	133	133	...	...	...	...	...
	90° " "	146	138	134	132	129	128	...	...	...	...	...
	0° Loaded	915	915	915	915	915	915	...	...	...	...	...
¼ in. 7 strand	30° No load	396	257	185	165	141	127	121	115	...	...	...
	60° " "	281	195	158	141	132	122	118	114	...	...	...
	90° " "	197	156	139	129	125	119	115	113	...	...	...
	0° Loaded	900	900	900	900	900	900	900	900	...	...	...
5 1-6 in. 7 strand	30° No load	1,019	876	731	596	484	373	349	315	301	294	290
	60° " "	779	661	552	465	412	354	328	305	296	290	288
	90° " "	584	482	432	381	364	324	310	297	291	287	286
	0° Loaded	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580
⅜ in. 7 strand	30° No load	1,354	1,229	1,099	950	881	678	591	521	494	481	472
	60° " "	1,070	963	854	757	687	598	544	501	488	478	468
	90° " "	804	729	660	616	576	531	506	482	472	466	463
	0° Loaded	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891

(a) Correspond to the sags of Table 25.

TABLE 30—TENSIONS FOR ORDINARY GRADE STEEL WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size Stl. W. G.	Conditions of load and Temp. F.	Tensions — Span Length—Feet										
		100	125	150	175	200	250	300	400	500	600	700
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 8	30° No load	52	46	43	43	42	41	40	...	...	...	...
	60° " "	46	43	42	41	41	40	40	...	...	...	...
	90° " "	42	42	41	40	40	40	39	...	...	...	...
	0° Loaded	508	508	508	508	508	508	508	...	...	...	...
No. 6	30° No load	132	103	92	87	84	80	77	...	...	...	...
	60° " "	100	89	84	80	79	77	76	...	...	...	...
	90° " "	88	80	78	77	76	76	75	...	...	...	...
	0° Loaded	712	712	712	712	712	712	712	...	...	...	...
No. 4	30° No load	313	225	186	169	158	148	148	...	...	...	...
	60° " "	211	176	162	156	147	142	139	...	...	...	...
	90° " "	153	147	143	139	138	136	134	...	...	...	...
	0° Loaded	982	982	982	982	982	982	982	...	...	...	...
¼ in. 7 strand	30° No load	566	415	285	216	183	156	145	136	134	...	...
	60° " "	419	298	222	185	166	148	140	134	133	...	...
	90° " "	291	218	181	162	152	141	136	132	131	...	...
	0° Loaded	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	...	...
5-16 in 7 strand	30° No load	1,192	1,070	924	782	649	491	416	363	345	333	328
	60° " "	931	819	698	596	514	426	384	350	336	328	325
	90° " "	729	610	518	462	422	380	356	339	320	323	322
	0° Loaded	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,710
⅜ in. 7 strand	30° No load	1,726	1,630	1,506	1,372	1,238	990	829	677	619	592	577
	60° " "	1,402	1,318	1,208	1,093	992	830	728	686	597	579	567
	90° " "	1,088	1,017	931	857	792	705	652	600	576	566	558
	0° Loaded	2,249	2,249	2,249	2,249	2,249	2,249	2,249	2,249	2,249	2,249	2,249

(a) Correspond to the sags of Table 26.

TABLE 31—TENSIONS FOR SIEMENS-MARTIN STEEL WIRE FOR DIFFERENT SPAN LENGTHS (a)

Size of Wire	Conditons of Load and Temp. F.	Tensions — Span Length—Feet											
		100	125	150	175	200	250	300	400	500	600	700	1,000
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
No. 8 Stl. W. G.	20° No load	139	99	76	67	63	60	58	56	...	...	...	...
	60° " "	119	81	69	64	61	58	57	56	...	...	...	...
	90° " "	84	70	63	61	59	57	56	55	...	...	...	...
	0° Loaded	694	694	694	694	694	694	694	694	...	...	...	...
No. 6 Stl. W. G.	30° No load	452	310	219	166	147	126	118	111	...	...	...	...
	60° " "	279	211	168	143	131	119	113	109	...	...	...	...
	90° " "	204	160	128	125	120	118	110	107	...	...	...	...
	0° Loaded	966	966	966	966	966	966	966	966	...	...	...	...
No. 4 Stl. W. G.	30° No load	835	685	536	417	342	261	230	207	...	...	...	...
	60° " "	598	478	337	322	281	239	212	201	...	...	...	...
	90° " "	410	337	237	250	232	218	203	193	...	...	...	...
	0° Loaded	1,347	1,347	1,347	1,347	1,347	1,347	1,347	1,347	...	...	...	...
¼ in. 7 strand	30° No load	1,003	896	770	641	505	315	244	199	184	177	...	...
	60° " "	845	740	628	505	396	272	226	192	181	175	...	...
	90° " "	689	590	438	389	314	249	210	186	178	173	...	...
	Loaded	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	...	...
5-16 in. 7 strand	30° No load	1,730	1,650	1,546	1,480	1,300	1,030	794	567	489	454	436	...
	60° " "	1,458	1,378	1,280	1,172	1,068	832	666	520	466	442	428	...
	90° " "	1,189	1,113	1,025	931	880	676	573	483	447	430	421	...
	0° Loaded	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	...
⅜ in. 7 strand	30° No load	2,652	2,566	2,495	2,419	2,315	2,109	1,868	1,411	1,114	967	891	801
	60° " "	2,292	2,235	2,166	2,097	2,006	1,805	1,596	1,281	1,019	915	859	788
	90° " "	1,964	1,907	1,844	1,778	1,696	1,517	1,368	1,033	941	870	829	776
	0° Loaded	3,061	3,061	3,061	3,061	3,061	3,061	3,061	3,061	3,061	3,061	3,061	3,061

(a) Correspond to the sags of Table 27.

3. MECHANICAL DATA FOR COPPER AND STEEL WIRE.

(a) **Copper Wire.** The following table contains data on the ultimate strength and per cent of elongation before failure of hard, medium, and soft copper wire as given in the 1915 report of the American Society for Testing Materials.

The elastic limit as given by the same society is 55 to 60 per cent of the ultimate strength for hard-drawn copper and 50 to 55 per cent for medium-drawn copper. There is no definite elastic limit for soft copper, but its behavior, after having a slight preliminary stretch, may be considered as approximately that of an elastic material having a limit of elasticity of 10,000 to 15,000 pounds per square inch.

The modulus of elasticity has been taken at 16,000,000 for all grades of copper. The coefficient of linear thermal expansion per degree F. has been taken as 0.96×10^{-5}

TABLE 32—MECHANICAL DATA FOR COPPER WIRE

Size A. W. G.	Diameter	Hard-drawn Average Ultimate Strength	Hard-drawn Average Elongation	Medium-drawn Average Minimum Ultimate Strength	Medium-drawn Average Maximum Ultimate Strength	Medium-drawn Elongation	Soft-drawn Average Ultimate Strength	Soft-drawn Average Elongation
	In.	Lbs. Sq. In.	Per Cent	Lbs. Sq. In.	Lbs. Sq. In.	Per Cent	Lbs. Sq. In.	Per Cent
No. 8......	0.128	63,700	1.06	49,660	56,560	1.08	....	....
No. 6......	.162	62,100	1.14	49,000	56,000	1.15	....	....
No. 4......	.204	60,100	1.24	48,330	55,350	1.25	37,000	30
No. 2......	.258	57,600	1.98	47,000	54,000	2.50	....	....
No. 1......	.289	56,100	2.17	46,000	53,000	2.75	....	....
No. 0......	.325	54,500	2.40	45,000	52,000	3.00	....	....
No. 00.....	.365	52,800	2.80	44,000	51,000	3.25	36,000	35
No. 000....	.41	51,000	3.25	43,000	50,000	3.60	....	....
No. 0000...	.46	49,000	3.75	42,000	49,000	3.75	....	....

(b) **Iron and Steel Wire and Cables.** The following table contains data on the strength of various grades of iron and steel wire and cables. The data for cables was obtained from tests made by the American Telephone and Telegraph Co. and by the Bureau of Standards, and for solid wire from manufacturers tables.

The elastic limit for different samples of the same grade of wire will vary over a considerable range, the minimum value being 0.45 of the ultimate strength and the maximum 0.55 of the ultimate. The average elastic limit, therefore, has been taken as one-half of the ultimate strength.

However, in order that the minimum value of elastic limit may not be exceeded in practice, the sags for iron and steel wire were all figured on the basis of a maximum stress of nine-tenths of the average elastic limit under the most extreme loading condition.

The coefficient of linear expansion for iron and steel per degree F. has been taken as 0.67×10^{-5}

TABLE 33—MECHANICAL DATA FOR IRON AND STEEL WIRES AND CABLES

Size Nominal	Actual Diameter	Area	Ultimate Strength of— EBB Iron	BB Iron	Ordinary Grade Steel	Siemens-Martin Steel	Modulus of Elasticity x10-6 of— EBB and BB	Ordinary Grade and Siemens-Martin
	In.	Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.	Lbs. Sq.In.		
No. 6 Stl. W. G........	0.165	0.0214	45,450	51,000	54,700	74,800	26	29
No. 6 Stl. W. G........	.203	.0324	45,450	51,000	54,600	74,000	26	29
Solid:								
No. 4 Stl. W. G........	.238	.0445	45,500	51,000	54,600	75,000	26	29
Stranded:								
¼ in., 7—83 mils.....	.249	.0379	47,500	52,700	60,700	79,200	19	21
5-16 in., 7—109 mils....	.327	.0654	47,400	52,000	58,100	78,400	19	21
⅜ in., 7—120 mils....	.36	.0792	48,000	53,000	63,200	85,900	19	21

4. RESULTANT CONDUCTOR LOADINGS.

The following table gives the resultant loading in pounds per foot for conductors of various size and material. The calculations are based on the assumed loadings given in order 1241 and on average values of the diameters of weather-proof wires. The over-all diameters of covered wires supplied by various manufacturers vary considerably and hence average values are chosen. This is also true of the sizes of the strands which make up stranded steel cables. The values of loading are based on the sizes of strands given in the table.

TABLE 34—CALCULATED LOADING FOR CONDUCTORS OF VARIOUS SIZES

Size of Conductor	Diameter over all In.	Weight of conductor Lbs. Per Ft.	Resultant loading Lbs. Per Ft.
Bare solid copper, A. W. G.			
No. 12....................	0.081	0.020	0.816
No. 10....................	.102	.032	.839
No. 8.....................	.128	.050	.872
No. 6.....................	.162	.0795	.917
No. 4.....................	.204	.126	.981
No. 2.....................	.258	.201	1.075
No. 1.....................	.289	.253	1.137
No. 0.....................	.325	.320	1.214
No. 00....................	.365	.403	1.309
No. 0000..................	.460	.641	1.575
T. B. W. P. solid copper, A. W. G.			
No. 12....................	.21	.035	.937
No. 10....................	.25	.058	.952
No. 8.....................	.26	.075	1.003
No. 6.....................	.32	.112	1.075
No. 4.....................	.38	.164	1.164
No. 2.....................	.44	.260	1.278
No. 1.....................	.47	.316	1.345
No. 0.....................	.50	.407	1.435
No. 00....................	.53	.502	1.532
No. 0000..................	.65	.767	1.850
T. B. W. P. stranded copper, A. W. G.			
No. 2.....................	.444	.270	1.285
No. 1.....................	.518	.328	1.395
No. 0.....................	.620	.424	1.557
No. 00....................	.662	.522	1.666
No. 0000..................	.785	.800	1.993
250,000 cir. mils.........	.862	.985	2.217
350,000 cir. mils.........	.978	1.345	2.619
500,000 cir. mils.........	1.103	1.894	3.217
750,000 cir. mils.........	1.343	2.822	4.272
1,000,000 cir. mils........	1.581	3.674	5.230
Bare stranded aluminum, A. W. G.			
No. 2.....................	.291	.061	1.023
No. 1.....................	.323	.077	1.065
No. 0.....................	.368	.097	1.112
No. 00....................	.414	.122	1.168
No. 0000..................	.522	.195	1.312
Bare steel—solid and stranded			
No. 2.....................	.291	.061	1.023
No. 1.....................	.323	.077	1.065
No. 0.....................	.368	.097	1.112
No. 00....................	.414	.122	1.168
No. 0000..................	.522	.195	1.312
Bare steel—solid and stranded			
No. 8 Stl. W. G. solid..............	.162	.069	.912
No. 6 Stl. W. G. solid..............	.192	.097	.953
No. 4 Stl. W. G. solid..............	.225	.134	1.006
¼ in., 7—83 mils. str..............	.249	.125	1.022
5-16 in., 7—109 mils. str..........	.327	.210	1.142
⅜ in., 7—120 mils. str.............	.360	.305	1.230
Bare solid copper No. 8 B. W. G...........	.165	.082	.921
Bare solid iron No. 12 B. W. G...........	.109	.032	.846
Bare solid iron No. 14 B. W. G...........	.083	.019	.818
Bare solid copper No. 12 N. B. S..........	.104	.033	.842
Bare solid copper No. 14 N. B. S..........	.080	.019	.814

APPENDIX B. LOADING DATA, MECHANICAL CHARACTERISTICS, AND RECOMMENDED SETTINGS OF OVERHEAD LINE SUPPORTS.

1. DATA FOR COMPUTING VERTICAL AND TRANSVERSE STRENGTH REQUIRED FOR LINE SUPPORTS

(a) **Assumed Vertical and Transverse Loads on Conductors of Various Materials and Sizes.** The vertical loads on supports due to the conductors with or without ice based on the assumptions of order 1242-a, are given in table 35. Values for vertical loadings for wires of other sizes and materials can be readily computed. The over-all diameters of weather-proof wire supplied by different manufacturers vary considerably, and hence average values are chosen for the table.

TABLE 35—VERTICAL LOADS ON CONDUCTOR SUPPORTS

Size of Conductor	In. Diameter over all	Lbs. Per Ft. Conductor+0.5 inch ice
Bare solid copper, A. W. G.	In.	Lbs. Per Ft.
No. 12..........................	0.081	0.281
No. 10..........................	.102	0.406
No. 8...........................	.128	0.440
No. 6...........................	.162	0.491
No. 4...........................	.204	0.564
No. 2...........................	.258	0.673
No. 1...........................	.289	0.744
No. 0...........................	.325	0.833
No. 00..........................	.365	0.940
No. 0000........................	.460	1.235
T. B. W. P. solid copper, A. W. G.		
No. 12..........................	.21	0.476
No. 10..........................	.25	0.510
No. 8...........................	.26	0.547
No. 6...........................	.32	0.621
No. 4...........................	.38	0.711
No. 2...........................	.44	0.843
No. 1...........................	.47	0.919
No. 0...........................	.50	1.029
No. 00..........................	.53	1.143
No. 0000........................	.65	1.482
T. B. W. P. stranded copper, A. W. G.		
No. 2...........................	.444	0.855
No. 1...........................	.518	0.961
No. 0...........................	.62	1.120
No. 00..........................	.662	1.245
No. 0000........................	.785	1.599
250,000 cir. mils..............	.862	1.832
350,000 cir. mils..............	.978	2.264
500,000 cir. mils..............	1.103	2.504
750,000 cir. mils..............	1.343	3.969
1,000,000 cir. mils............	1.531	4.937
Bare stranded alumium, A. W. G.		
No. 2...........................	.291	0.553
No. 1...........................	.323	0.592
No. 0...........................	.368	0.636
No. 00..........................	.414	0.691
No. 0000........................	.522	0.831
Bare solid copper, No. 8 B. W. G............	.165	0.495
Bare solid copper, No. 12 N. B. S............	.104	0.409
Bare solid copper, No. 14 N. B. S............	.080	0.350
Bare solid iron, No. 12 B. W. G............	.109	0.410
Bare solid iron, No. 14 B. W. G............	.083	0.351
Bare steel—solid and stranded.		
No. 8 Stl. W. G.—Solid..............	.162	.481
No. 6 Stl. W. G.—solid..............	.192	.527
No. 4 Stl. W. G.—solid..............	.225	.597
¼ in., 7—83 mils., stranded.........	.249	.690
5-16 in., 7—109 mils., stranded......	.327	.725
⅜ in., 7—120 mils., stranded.........	.360	.830

The values of transverse loads computed from orders 1240 (b), 1242-b, 1280-c, and 1281 for various grades of construction (A, B, C, D, or E) are given in table 36.

These values are computed on the assumption that a definite fiber stress, equal to have the ultimate strength of the material, will be considered as a limiting value, and that the loading specified in orders 1242 and 1250 for grades B and D will be modified to apply to the other grades. Thus the column headed "B, D" is computed for an eight pound wind and a half inch of ice on conductors. The next column to the right gives values two-thirds as great. The column headed A gives values 50 per cent larger than for B. It must be remembered that for signal poles not guyed, double strength is called for and this is most easily figured by simply doubling the quantity given rather than to introduce different working stresses in the material.

Values for transverse loadings for wires of other outside diameters can be readily computed by adding one inch to the outside diameter in inches, which will give the force in column A. This results because one must divide by twelve to convert to feet, multiply by 8 to give values for B and increase these by one half for A.

TABLE 36—EQUIVALENT TRANSVERSE FORCE ON WIRES
Actual force on ice-covered wire modified for grade (pounds per conductor per foot)

Size of Conductor	A	B D	C E
Bare solid, A. W. G.			
No. 12........................	1.08	0.721	0.480
No. 10........................	1.10	.735	.490
No. 8.........................	1.13	.752	.501
No. 6.........................	1.16	.776	.516
No. 4.........................	1.20	.803	.535
No. 2.........................	1.26	.839	.559
No. 1.........................	1.29	.859	.573
No. 0.........................	1.33	.883	.589
No. 00........................	1.37	.910	.607
No. 0000......................	1.46	.973	.649
T. B. W. P. solid. A. W. G.			
No. 12........................	1.21	0.807	0.538
No. 10........................	1.25	.833	.555
No. 8.........................	1.26	.840	.560
No. 6.........................	1.32	.880	.587
No. 4.........................	1.38	.920	.613
No. 2.........................	1.44	.960	.640
No. 1.........................	1.37	.980	.653
No. 0.........................	1.50	1.000	.667
No. 00........................	1.53	1.020	.680
No. 0000......................	1.65	1.100	.733
T. B. W. P. stranded, A. W. G.			
No. 2.........................	1.44	0.963	0.642
No. 1.........................	1.52	1.012	.675
No. 0.........................	1.62	1.080	.720
No. 00........................	1.66	1.108	.739
No. 0000......................	1.79	1.190	.793
250,000 cir. mils............	1.86	1.241	.828
350,000 cir. mils............	1.98	1.319	.879
500,000 cir. mils............	2.11	1.405	.937
750,000 cir. mils............	2.34	1.58	1.041
1,000,000 cir. mils..........	2.53	1.69	1.125
Bare stranded, A. W. G.			
No. 2.........................	1.29	0.861	0.574
No. 1.........................	1.33	.885	.590
No. 0.........................	1.38	.917	.611
No. 00........................	1.41	.943	.628
No. 0000......................	1.52	1.015	.676
Bare solid. No. 8 B. W. G.........	1.17	0.777	0.518
Bare solid, No. 12 B. W. G.........	1.11	.739	.493
Bare solid, No. 14 B. W. G.........	1.08	.722	.481
Bare solid, No. 12 N. B. S.........	1.10	.736	.491
Bare solid, No. 14 N. B. S.........	1.08	.720	.480
Bare solid and stranded.			
No. 8 Stl. W. G. solid..............	1.162	.773	.516
No. 6 Stl. W. G. solid..............	1.192	.794	.530
No. 4 Stl. W. G. solid..............	1.225	.816	.544
¼ in., 7—83 mils. str...............	1.249	.833	.555
5-16 in., 7—109 mils. str...........	1.327	.854	.590
⅜ in., 7—120 mils. str..............	1.360	.906	.604

(b) **Calculation of Moments of Resistance of Poles.** The resisting moments of sound chestnut, western red cedar, and cypress poles for varying ground-line circumferences given in table 37 are based on a maximum allowable fiber stress of 2,500 pounds per square inch, which is one-half of the assumed ultimate strength.

The resisting moments of northern white cedar and redwood poles are based upon an allowable fiber stress of 1,800 pounds per square inch, which is one-half of the assumed ultimate strength.

For other varieties of wood poles, the resisting moments will be in the same proportion to those tabulated as the relative ultimate strengths of the different woods.

For sound southern yellow pine, the same values as for chestnut may be used. Values 30 per cent greater than for chestnut may be used for dense southern yellow pine meeting the standard of the American Society for Testing Materials. Southern yellow pine should not be used for supporting structures unless creosoted or subjected to some other preservative treatment, as otherwise the rapid deterioration will require early replacement.

The following formula has been used in calculating the moments:

$M=0.0002638\,f\,C^3$ = moment in pound-feet: where
f = allowable fiber stress in pounds per square inch, and
C = circumference of the pole at ground line in inches.

While the ground-line section may not be the most stressed section in poles with considerable taper, it is so regarded here. Since the wood usually deteriorates most rapidly at this point, it is here that sufficient strength must be provided.

TABLE 37—RESISTING MOMENTS OF SOUND WOOD POLES FOR VARIOUS GROUND-LINE CIRCUMFERENCES. BASED ON A MAXIMUM ALLOWABLE FIBER STRESS OF 2500 POUNDS PER SQUARE INCH FOR CHESTNUT. WESTERN RED CEDAR, AND CYPRESS, AND 1800 POUNDS PER SQUARE INCH FOR NORTHERN WHITE CEDAR AND REDWOOD

Circumference at ground in inches	Resisting moments in pound-feet for fiber stress of 2,500 pounds per square inch	1,800 pounds per square inch	Circumference at ground in inches	Resisting moments in pound-feet for fiber stress of 2,500 pounds per square inch	1,800 pounds per square inch
24	9,120	6,560	50	82,400	59,400
25	10,300	7,420	51	87,500	63,000
26	11,600	8,350	52	92,700	66,800
27	13,000	9,350	53	98,200	70,700
28	14,500	10,400	54	103,800	74,800
29	16,100	11,600	55	109,700	79,000
30	17,800	12,800	56	115,800	83,400
31	19,650	14,150	57	122,100	87,900
32	21,600	15,600	58	128,700	92,650
33	23,700	17,100	59	135,400	97,750
34	25,900	18,700	60	142,500	102,600
35	28,300	20,400	61	149,700	107,800
36	30,800	22,150	62	157,200	113,200
37	33,400	24,050	63	164,900	118,700
38	36,200	26,100	64	172,900	124,500
39	39,100	28,200	65	181,100	130,400
40	42,200	30,400	66	189,600	136,500
41	45,450	32,700	67	198,400	142,800
42	48,900	35,200	68	207,400	149,300
43	52,400	37,750	69	216,700	156,000
44	56,200	40,450	70	226,200	162,900
45	60,100	43,300	71	236,000	170,000
46	64,200	46,200	72	246,200	177,300
47	8,500	49,300	73	256,600	184,800
48	72,000	52,500	74	267,200	192,400
49	77,600	55,900	75	278,200	200,300

2. METHOD FOR DETERMINING SIZE OF WOOD POLE REQUIRED

(a) **Formula Used.**

Given the span length, the size, material, number, and height of conductors, the size of pole which will fulfill the requirements of orders 1240-b, 1242-b, 1280-c and 1281 may be obtained by use of the following formulas for any transverse strength requirement as determined by hazards involved:

Let n_1 to n_n = number of conductors in groups, all conductors in a group being of the same outside diameter and at the same elevation.
N = total number of conductors.
P_1 to P_n = equivalent transverse forces in pounds per foot of span for the sizes of conductors in the respective groups, as taken from table 36.
h_1 to h_n = respective elevations above ground, in feet, of conductors subjected to forces P_1 to P_n.
S = span length in feet (or one-half the sum of the adjacent spans).
P_o = pressure in pounds per square foot as given in the rules mentioned above, according to local conditions (A, B, C, D or E).
D = estimated mean diameter of pole, in feet.
H = height of pole, above ground, in feet.

Then the moment due to the pressure on the pole is $M_p = \frac{1}{6} P_o D H^2$ pound-feet and the moment due to the pressure on the conductor is

$M_c = S\,(P_1 n_1 h_1 + P_2 n_2 h_2 + \dots P_n n_n h_n)$ pound-feet, and the total bending moment on the pole is $M=M_p+M_c$. This value of M will always be employed for poles carrying supply lines only, but where only signal conductors are concerned, the bending moment to be considered, in order to fulfill the requirements of order 1281 will be as follows, when side guys are to be used:

$$M=M_p+M_c,\ \text{when N is not greater than 10:}$$

$$M=M_p+\frac{10M_c}{N},\ \text{when N is 11, 12, 13 or 14; or}$$

$$M=M_p+\tfrac{2}{3}M_c,\ \text{when N is not less than 15.}$$

When it is intended to use a pole strong enough to allow the omission of side guys, the bending moment to be considered will be $M=2\,(M_p+M_c)$, or

$$M=2\left(M_p+\frac{10}{N}M_c\right),\ \text{or}\ M=2\,(M_p+\tfrac{2}{3}M_c),$$

according to the value of N.

A pole should then be selected having a length equal to H plus the depth to which it is set in the ground, and a ground-line circumference given, by table 37, a resisting moment equal to, or greater than, M as obtained from the above formulas.

(b) **Examples.**

(1) Suppose it is desired to choose a pole to comply with the orders under the following conditions:

Adjacent span 61′ 8″ and 89 feet; average span 75.33 feet.
Height of pole above ground 62 feet.
Line in urban territory, and carrying the following wire load:

Height of arm above ground	Size of Wire	Kind of Wire	Number of Wires	Voltage (or other class)
60.33	6 A. W. G.	T. B. W. P. solid copper......	6	7.6 amp.
58.33	6 A. W. G.	T. B. W. P. solid copper......	6	7.6 amp.
56.33	6 A. W. G.	T. B. W. P. solid copper......	6	7.6 amp.
54.33	0000 A. W. G.	T. B. W. P. solid copper......	4	2,300 volts
52.33	0000 A. W. G.	T. B. W. P. solid copper......	4	2,300 volts
50.33	0000 A. W. G.	T. B. W. P. solid copper......	6	2,300 volts
48.33	00 A. W. G.	T. B. W. P. solid copper......	2	2,300 volts
44.33	350,000 c. m.	T. B. W. P. solid copper......	4	2,300 volts
44.32	6 A. W. G.	T. B. W. P. solid copper......	1	7.6 amp.
42.33	6 A. W. G.	T. B. W. P. solid copper......	2	110 volts

According to order 1231 (b), this pole will be required to comply with grade C, and the transverse loading due to the wires will be computed as follows, the values of "Force per foot" being taken from column C of table 36.

Span length in feet		Force in pounds per foot		Number of Wires		Height above ground in feet		Bending moment (pound-feet)
75.33	×	.587	×	6	×	60.33	=	15960
75.33	×	.587	×	6	×	58.33	=	15420
75.33	×	.587	×	6	×	56.33	=	14900
75.33	×	.734	×	4	×	54.33	=	11280
75.33	×	.734	×	4	×	52.33	=	11520
75.33	×	.734	×	6	×	50.33	=	16620
75.33	×	.68	×	2	×	48.33	=	4950
75.33	×	.68	×	4	×	44.33	=	11720
75.33	×	.587	×	1	×	44.32	=	1960
75.33	×	.587	×	2	×	42.33	=	3740
						M	=	108770

Assume pole to be used will be one having an allowable fiber stress of 2,500 pounds per square inch. A pole of 57 inches ground-line circumference will have a resisting movement of 122000 pound-feet. The rules require a minimum top diameter of 6 inches, and for a pole of this size

$$M_p=\frac{1}{2}\times\left(\frac{2}{3}\times 8\right)\times\frac{6+\frac{57}{3.14}}{2\times 12}\times 62^2=10300\ \text{pound-feet,}$$

$$M=M_p+M_c=10300+108800=119160$$

(2) Suppose it is desired to determine whether or not the pole used complies with the orders, under the following conditions:

Adjacent spans 124.2 feet and 139.1 feet; average span 131.65 feet.
Height of pole above ground, 43 feet.
Western red cedar pole, of 10 inches top diameter, and 60 inches ground-line circumference.
Line crossing over railroad and carrying the following load:

Height of arm above ground	Size of Wire	Kind of Wire	Number of Wires	Voltage (or other class)
45.5	¼ in.	Bare Str. steel	1	ground
42.17	0000 A. W. G.	T. B. W. P. Str. copper......	3	13,000 volts
39.67	0000 A. W. G.	T. B. W. P. Str. copper......	2	13,000 volts
37.17	0000 A. W. G.	T. B. W. P. Str. copper......	4	13,000 volts
32.17	6 A. W. G.	T. B. W. P. Sol. copper......	1	6.6 amp.
32.17	2 A. W. G.	T. B. W. P. Sol. copper......	3	2,300 volts
28.17	10 A. W. G.	Bare Sol. copper..............	2	pvt. tel.

According to order 1233-a, this pole will be required to comply with grade A, and the transverse loading due to the wires will be computed as follows, the values of "Force per foot" being taken from column A of table 36:

Span length		Force in pounds per foot		Number of Wires		Height above ground in feet		Bending moment (pound-feet)
131.65	×	1.25	×	1	×	45.5	=	7500
131.65	×	1.78	×	3	×	42.17	=	29600
131.65	×	1.78	×	2	×	39.67	=	18600
131.65	×	1.78	×	4	×	37.17	=	34800
131.65	×	1.32	×	1	×	32.17	=	5600
131.65	×	1.44	×	3	×	32.17	=	18300
131.65	×	1.10	×	2	×	28.17	=	8100
						Mc	=	122500

$$M_p=\frac{1}{2}\times\left(\frac{3}{2}\times 8\right)\times\frac{10+\frac{60}{3.14}}{2\times 12}=43^2 \qquad = \qquad 13400$$

$$M=M_p+M_c \qquad = \qquad 135900$$

By table 37, the resisting moment for a ground-line circumference of 60 inches at a fiber stress of 2500 pounds per square inch is 142500 pound-feet. Since this is greater than M, this pole is strong enough to comply with the orders.

(3) Suppose it is desired to determine whether or not the pole and side guys used comply with the orders, under the following conditions:

Adjacent spans 104′ 6″ and 115′ 6″; average span, 110 feet.
Height of pole above ground, 52 feet.
Chestnut pole of 8 inches top diameter, and 60 inches ground-line circumference.
Signal line crossing over railroad and carrying the following wire load.

Height of arm above ground	Size of Wire	Kind of Wire	Number of Wires	Voltage (or other class)
51	8 B. W. G.	Bare copper	8	Signal
49	12 N. B. S.	Bare copper	10	Signal
47	12 N. B. S.	Bare copper	10	Signal
45	12 N. B. S.	Bare copper	10	Signal
43	12 N. B. S.	Bare copper	5	Signal

According to order 1235-a, this pole will be required to comply with grade D. and the transverse loading due to the wires will be computed as follows: the values of "Force per foot" being taken from column D of table 36.

Span length in feet		Force in pounds per foot		Number of Wires		Height above ground in feet		Bending moment (pound-feet)
110	×	.777	×	8	×	51	=	34900
110	×	.736	×	10	×	49	=	39700
110	×	.736	×	10	×	47	=	38100
110	×	.736	×	10	×	45	=	36500
110	×	.736	×	5	×	43	=	17400
						Mc	=	166600

$$M_p=\frac{1}{2}\times 8\times\frac{8+\frac{60}{3.14}}{2\times 12}\times 52^2 \qquad = \qquad 12200$$

Since N is greater than 15, $M = M_p + \tfrac{2}{3}M_c = 12200 + 111065 = 123265$ pound-feet, if side guys are used, or twice this value, this is, 246530 pound-feet, if side guys are not used.

By table 37, the resisting moment for a ground-line circumference of 60 inches and a fiber stress of 2500 pounds per square inch is 142500 pound-feet. Since this is less than the value of M to be used without side guys, the guys will be required, and will be required to take the entire horizontal load.

By reference to table 37 it will be seen that a pole slightly larger than 72 inches in ground line circumference will be required if guys can not be installed.

Assume that guys are installed having a lead one-third of the height of attachment to the pole, or a lead of 15 feet with a height of attachment of 45 feet.

The force necessary at a height of 45 feet to produce—or to counteract—a bending moment of 123265 pound-feet at the ground line is

$$\frac{123265}{45}=2740$$

pounds, and the equivalent force acting in the direction of the guy will be

$$\sqrt{\frac{15^2+45^2}{15}}\times 2740 = 8660$$ pounds. A guy will therefore be required having a tensile strength at least equal to $2\times 8660=17320$ pounds.

4. Suppose it is desired to determine whether or not the pole used complies with the orders, under the following conditions:

Adjacent spans 104 feet and 92 feet; average span, 98 feet.
Height of pole above ground, 48 feet.
Chestnut pole, of 9 inches top diameter, and 58½ inches ground-line circumference.

Joint supply and signal line and carrying the following wire load.

Height of arm above ground	Size of Wire	Kind of Wire	Number of Wires	Voltage (or other class)
47	6 A. W. G.	T. B. W. P. Sol. copper......	6	6.6 amp.
45	6 A. W. G.	T. B. W. P. Sol. copper......	6	6.6 amp.
43	0000 A. W. G.	T. B. W. P. Sol. copper......	3	2,300 volts
43	00 A. W. G.	T. B. W. P. Sol. copper......	3	2,300 volts
41	2 A. W. G.	T. B. W. P. Sol. copper......	6	2,300 volts
39	2 A. W. G.	T. B. W. P. Sol. copper......	3	230 volts
39	6 A. W. G.	T. B. W. P. Sol. copper......	2	6.6 amp.
35	12 N. B. S.	Bare copper	10	Telephone
33	12 N. B. S.	Bare copper	8	Telephone

According to order 1234-c, this pole will be required to comply with grade C, and the transverse loading due to the wires will be computed as follows, the values of "Force per foot" being taken from column C of table 36:

	Span† length in feet		Force in lbs. per foot		Number of wires		Height above ground in feet		Bending moment in pound-feet
	98	times	.587	times	6	times	47	equals..............................	16,250
	98	times	.587	times	6	times	45	equals..............................	15,550
	98	times	.734	times	3	times	43	equals..............................	9,280
	98	times	.68	times	3	times	43	equals..............................	8,600
	98	times	.96	times	6	times	41	equals..............................	23,100
	98	times	.96	times	3	times	39	equals..............................	11,000
	98	times	.587	times	2	times	35	equals..............................	4,190
½ times	98	times	.491	times	10	times	39	equals..............................	8,410
½ times	98	times	.491	times	8	times	39	equals..............................	6,350
								Mc =	103,030

$$M_p=\frac{1}{2}\times\left(\frac{2}{3}\times 8\right)\times\frac{9+\frac{58.5}{3.14}}{2\times 12}\times 48^2=7,070$$

M equals Mc plus Mp equals 110,100

table 37 the resisting moment for a ground line circumference is 58¼ es and a fiber stress of 2500 pounds per square inch is 132000 pound-feet interpolation between 58 and 59 inches). Since this is greater than M. pole is strong enough.

ILLUSTRATION OF ALLOWABLE NUMBER OF WIRES ON A GIVEN POLE, AND ON A POLE SUPPORTED BY A GIVEN SIDE GUY.

Assumptions on which Tables 38, 39 and 40 are based. In table 38 it is

(1) that all wire positions are filled and that crossarms are 2 feet that poles are set 5.5 feet in the ground; (3) that 6 pin crossarms (unless otherwise stated;) (4) that the placing of wires is begun at arm (wires 6 inches below the top of poles) and continues to lower es until limited by strength of pole or clearance of wires above to a minimum of 19 feet at the support. This is assumed to be the allowable clearance at the support if 18 feet clearance is to be ained at the center of the span (see table III). Frequently a less num- crossarms is necessary where larger sags make the difference in

regarding the last two lines see also order 1272-d.

tion between the support and the center of span greater than 1 foot. tables 15, 16, 17, 24, 25, 26, and 27, appendix A.)

tables 39 and 40 it is assumed (1) that the guys carry their loads with a of safety of 2; (2) that they are installed with a lead of 1 to 3; (3) they are attached at the center of the load, this making it unnecessary to into account the height of the pole. The wind pressure on the pole has not been taken into account in these tables. This will be equivalent one or more wires, depending on size and height of pole, and should ected in each case.

of table 38, the maximum number of wires which can be carried in ance with these rules by sound chestnut, western red cedar, cypress southern pine poles of different ground-line circumferences and different for a 35 foot pole, is given in table 38, according to the hazards in- (A, B, or C).

table may also be used for poles of greater height by using the ground- circumference, but reducing the allowable number of wires, in proportion increase in elevation of the point of application of the load.

taper of 2 inches per 5 linear feet is assumed in table 38, but is used only calculating the bending moment due to the wind pressure on the pole the pole strength is based entirely upon the ground-line circumference, to be the most stressed section.

ALLOWABLE NUMBER OF NO. 4 SOLID COPPER T. B. W. P. WIRES TO BE CARRIED BY 35 FOOT SOUND CHESTNUT, WESTERN RED CEDAR, SOUTHERN PINE, AND CYPRESS POLES HAVING GROUND-LINE CIRCUMFERENCES OF FROM 32 TO 48 INCHES AND UNDER VARIOUS HAZARDS (A, B OR C). (See foregoing explanatory note.)

Hazard	Span in Feet	Number of wires to be carried by pole having ground circumference of								
		32 in.	34 in.	36 in.	38 in.	40 in.	42 in.	44 in.	46 in.	48 in.
A	100	x	6	7	8	10	11	13	16	18
	125	x	4	5	6	8	9	10	12	14
	150	x	4	4	5	6	7	9	10	12
	200	x	3	3	4	5	5	6	7	9
B	100	x7	9	11	13	16	15	22	26	30
	125	x6	7	9	10	12	14	17	20	23
	150	x5	6	7	8	10	12	14	16	19
	200	x4	4	5	6	7	9	10	12	14
C	100	12	14	17	21	25	31	36	xx40	xx48
	125	9	11	14	18	20	23	28	33	36
	150	8	9	11	13	16	19	22	26	31
	200	6	7	8	10	12	14	16	19	22

tables 39 and 40. The maximum number of wires which can be in compliance with these orders, by poles supported by side guys of strengths with various values of average span is given in table 39 for signal lines of grades A, B, and C), and in table 40 of grades D and E.

ALLOWABLE NUMBER OF NO. 4 SOLID COPPER T. B. W. P. WIRES TO BE CARRIED ON POLES SUPPORTED BY SIDE GUYS OF VARIOUS STRENGTHS UNDER VARIOUS CONDITIONS OF HAZARD (A, B OR C). (See foregoing explanatory note.)

Hazard	Span in Feet	Number of the designated wires allowed with specified numbers and strengths of side guys.						
		1-4000 lb.	1-6000 lb.	1-10000 lb.	1-6000 lb.	2-10000 lb.	1-10000 lb. 1-16000 lb.	2-16000 lb.
A	75	6	9	15	24	31	40	49
	100	5	7	11	18	23	30	37
	125	4	6	9	15	18	24	29
	150	3	5	8	12	15	20	24
B	75	9	14	23	37	46	60	73
	100	7	10	17	27	34	45	55
	125	6	8	14	22	27	36	44
	150	5	7	11	18	23	30	[illegible]
C	75	11	21	34	55	69	89	
	100	10	15	26	41	52	67	
	125	8	12	21	33	41	54	
	150	7	10	17	28	34	45	[illegible]

For grade A 35-foot poles can not be used with so small a ground-line circumference pole top would be less than 7 inches. (See order 1244d.)

These numbers of wires will require 3 pin cross arms.

ALLOWABLE NUMBER OF NO. 8 (B. W. G.) BARE IRON WIRES TO BE CARRIED ON POLES SUPPORTED BY SIDE GUYS OF VARIOUS STRENGTHS UNDER VARIOUS CONDITIONS OF HAZARD (D OR E). (See foregoing explanatory note.)

Hazard	Span in Feet	Number of the designated wires allowed with specified numbers and strengths of side guys.						
		1-4000 lb.	1-6000 lb.	1-10000 lb.	1-16000 lb.	2-10000 lb.	1-10000 lb. 1-16000 lb.	2-16000 lb.
D	75	10	21	41	65	81	....	....
	100	8	13	31	49	61	79	98
	125	7	10	24	39	49	63	78
	150	5	8	20	33	41	53	65
E	75	21	37	61	....	....	....	....
	100	15	27	46	73	92	....	....
	125	10	22	37	59	73	95	....
	150	8	15	31	49	61	79	98

places in the above tables indicate that more than 100 wires can be carried by the size and number of guys in question under the indicated and span length, without exceeding one-half of the of the guys. Where the number of wires carried by a pole good practice to install some of them in cable.

MINIMUM POLE SIZES AND RECOMMENDED DEPTH OF SETTING.

Minimum Poles Sizes. The dimensions of poles given in tables 41, 42, referred to in orders 1244-c and 1253-a and are required of loading specified by these orders. The dimensions are chestnut, western white cedar, red cedar, western cedar, Idaho eastern or northern white cedar poles. Where other poles than the dimensions required for any given grade of construction be taken the same as poles having an equal ultimate fiber strength.

Note: It is not advisable to use some kinds of poles without preservative treatment.

TABLE 41—MINIMUM DIMENSIONS OF CHESTNUT POLES.
Sizes specified in orders 1244-c and 1253-a.

	Minimum Circumference of Poles*					
	For grade D, with more than 40 signal wires (order 1253a), and for Grade A supply lines (order 1244c)		For grade D with 21 to 40 signal wires (order 1253a), for grade E, with more than 40 signal wires (order 1253a) and for grades B and C supply lines (order 1244c)		For grade D, with not more than 20 signal wires (order 1253a), and for grade E with not more than 40 signal wires (order 1253a)	
	Circumference		Circumference		Circumference	
	At top	At 6 ft. from butt	At top	At 6 ft. from butt	At top	At 6 ft. from butt
	In.	In.	In.	In.	In.	In.
	24	33	22	30	20	27
	24	36	22	33	20	30
	24	40	22	36	20	33
	24	43	22	40	20	36
	24	45	22	43	20	40
	24	48	22	47	20	43
	24	51	22	50	20	46
	22	54	22	53	20	49
	22	57	22	56	....	....
	22	60	22	59	....	....
	22	63	22	62	....	....
	22	66	22	65	....	....
	22	70	22	69	....	....
	22	73	22	72	....	....
	22	76	22	75	....	....

*These pole dimensions correspond to specifications for class A, B, and C poles, respectively, of the National Electric Light Association, American Telephone and Telegraph Co., and Western Union Telegraph Co.

MINIMUM DIMENSIONS OF WESTERN WHITE CEDAR, RED CEDAR, WESTERN CEDAR, AND IDAHO CEDAR POLES.
Sizes specified in orders 1244-c and 1253-a.

	Minimum Circumference of Poles*					
	For grade D, with more than 40 signal wires (order 1253a), and for Grade A supply lines (order 1244c)		For grade D with 21 to 40 signal wires (order 1253a), for grade E, with more than 40 signal wires (order 1253a) and for grades B and C supply lines (order 1244c)		For grade D, with not more than 20 signal wires (order 1253a), and for grade E with not more than 40 signal wires (order 1253a)	
	Circumference		Circumference		Circumference	
	At top	At 6 ft. from butt	At top	At 6 ft. from butt	At top	At 6 ft. from butt
	In.	In.	In.	In.	In.	In.
	28	30	25	28	22	26
	28	34	25	31	22	28
	28	37	25	34	22	30
	28	40	25	36	22	32
	28	43	25	38	22	34
	28	45	25	40	22	36
	28	47	25	42	22	38
	28	49	25	44	22	40
	28	52	25	46	22	41
	28	54	25	48	22	43

*These pole dimensions correspond to specifications for class A, B, and C poles, respectively, of the National Electric Light Association, American Telephone and Telegraph Co., and Western Union Telegraph Co.

TABLE 43—MINIMUM DIMENSIONS OF EASTERN OR NORTHERN WHITE CEDAR POLES.
Sizes specified in orders 1244-c and 1253-a.

Length of Pole in Feet	Minimum Circumference of Poles*					
	For grade D, with more than 40 signal wires (order 1253a), and for Grade A supply lines (order 1244c)		For grade D with 21 to 40 signal wires (order 1253a), for grade E, with more than 40 signal wires (order 1253a) and for grades B and C supply lines (order 1244c)		For grade D, with not more than 20 signal wires (order 1253a), and for grade E with not more than 40 signal wires (order 1253a)	
	Circumference		Circumference		Circumference	
	At top	At 6 ft. from butt	At top	At 6 ft. from butt	At top	At 6 ft. from butt
	In.	In.	In.	In.	In.	In.
20	24	33	22	29	18.75	27
25	24	36	22	32	18.75	30
30	24	40	22	36	18.75	33
35	24	43	22	38	18.75	36
40	24	47	22	43	18.75	40
45	24	50	22	47	18.75	43
50	24	53	22	50	18.75	46
55	24	56	22	53	18.75	49
60	24	59	22	56	....	....

*These pole dimensions correspond to specifications for class A, B, and C poles, respectively, of the National Electric Light Association, American Telephone and Telegraph Co., and Western Union Telegraph Co.

(b) **Recommended Depth of Setting of Poles.**
The values given in table 44 are those recommended as the depths to which poles should be set under ordinary straight-line conditions in firm soil or rocks. On corners or angles or heavy dead ends these values should be increased by at least 6 inches. (See order 1251-a.)

TABLE 44—RECOMMENDED DEPTH OF SETTING OF POLES. ORDER 1251-a.

Length of Pole in Feet	Setting in Soil Feet	Setting in Rock Feet
20	5	3
25	5	3.5
30	5.5	3.5
35	6	4
40	6	4
45	6.5	4.5
50	7	4.5
55	7	5
60	7.5	5
65	8	6
70	8	6
75	8.5	6
80	9	6.5

5. Depreciation of Wood Poles
Where a pole is required to conform to a definite grade of construction, A, B, or C, it must be maintained by being replaced or reinforced in accordance with order 1244-b. The maximum allowable depreciation for grades A and B construction is one-third of the initial strength, and for grade C is one-half of the initial strength. Table 45 gives the minimum depreciated ground-line circumference and maximum allowable radial depreciation for wood poles of initial ground-line circumference from 24 to 75 inches, inclusive. These values are independent of the material of the pole.

TABLE 45—DEPRECIATION OF WOOD POLES.

Ground-line circumference when installed	Minimum depreciated ground-line circumference for		Maximum allowable radial depreciation for	
In.	In.	In.	In.	In.
	Grades A and B	Grade C	Grades A and B	Grade C
In.				
24	21.0	19.1	0.48	0.79
25	21.8	19.8	.50	.82
26	22.7	20.6	.52	.85
27	23.6	21.4	.54	.89
28	24.5	22.2	.56	.92
29	25.3	23.0	.58	.95
30	26.2	23.8	.60	.99
31	27.1	24.6	.62	1.02
32	28.0	25.4	.64	1.05
33	28.8	26.2	.66	1.08
34	29.7	27.0	.68	1.12
35	30.6	27.8	.70	1.15
36	31.5	28.6	.72	1.18
37	32.3	29.4	.74	1.21
38	33.2	30.2	.76	1.25
39	34.1	31.0	.78	1.28
40	34.9	31.8	.81	1.31
41	35.8	32.6	.82	1.34
42	36.7	33.3	.85	1.38
43	37.6	34.1	.87	1.41
44	38.4	34.9	.88	1.44
45	39.3	35.7	.91	1.48
46	40.2	36.5	.92	1.51
47	41.1	37.3	.95	1.54
48	41.9	38.1	.97	1.58
49	42.8	38.9	.99	1.61
50	43.7	39.7	1.01	1.64
51	44.6	40.5	1.03	1.67
52	45.4	41.3	1.05	1.71
53	46.3	42.1	1.07	1.74
54	47.2	42.9	1.09	1.77
55	48.1	43.7	1.11	1.80
56	48.9	44.5	1.13	1.84
57	49.8	45.3	1.15	1.87
58	50.7	46.0	1.17	1.90
59	51.5	46.8	1.19	1.94
60	52.4	47.6	1.21	1.97
61	53.3	48.4	1.23	2.00
62	54.2	49.2	1.25	2.03
63	55.0	50.0	1.27	2.07
64	55.9	50.8	1.29	2.10
65	56.8	51.6	1.31	2.13
66	57.7	52.4	1.33	2.17
67	58.5	53.2	1.35	2.20
68	59.4	54.0	1.37	2.23
69	60.3	54.8	1.39	2.26
70	61.2	55.6	1.41	2.30
71	62.0	56.4	1.43	2.33
72	62.9	57.2	1.45	2.36
73	63.8	58.0	1.47	2.40
74	64.7	58.7	1.49	2.43
75	65.5	59.5	1.51	2.46

PART 3
ELECTRICAL UTILIZATION OF EQUIPMENT
SECTION 130. SCOPE OF ORDERS.

Order 1300. **Accessible to Other Than Qualified Persons.**
The following orders, sections 130-139 inclusive, apply to all electrical utilization equipment, operating at voltages above 25 volts, except where other voltage limitations are given, where accessible to other than qualified electrical operators, as in mills, factories, mercantile establishments, hotels, theaters, and other public buildings, apartment houses, residences, etc.

Exception: Signal equipment connected to signal lines and radio signalling apparatus is exempted, except from section 139.

Order 1301. **Equipment Accessible to Qualified Persons Only.**
Electrical utilization equipment, however, as well as generating equipment, if inclosed in a separate room or inclosure, which is in charge of a qualified person and which is accessible only to such persons, may be installed in conformity with the orders applying to Electrical Supply Stations (Part 1) and in that case does not come under these orders.

SECTION 131. GENERAL PROTECTIVE ARRANGEMENTS.

Order 1310. Guarding Live Parts.
(a) **Equipment.**
(1) All ungrounded current-carrying parts of equipment, operating at voltages higher than 100 volts to ground, shall be suitably guarded, if elevated less than eight feet above floor or platform, of if exposed to contact above that level.

Exception: In locations where there are no exposed grounded surfaces within reach of persons when touching the parts under consideration and where none of the conditions listed as hazardous in Order 1312 exist, such parts operating at voltages less than 150 volts to ground are exempted from this order.

(2) Where guards must at times be opened, thereby exposing live parts, they shall be of insulating material or so arranged that they cannot readily make contact with live parts while being removed.

(3) Where persons must at times enter inclosures while parts are alive the guards shall be of insulating material unless removed 4 feet horizontally from all live parts.

(4) Under either of these conditions insulating mats or platforms shall be provided in location having grounded floors.

(b) **Conductors.**
(1) All conductors, not included in (2), (3) and (4) below, when brought closer to floor or platform than 8 feet, or when exposed to mechanical injury above that level, shall be guarded by inclosure in conduit, armored cable or metal raceways.

Exception: (1) At small platforms erected subsequent to the installation of the wiring or where metallic conduit, armored cable or metal raceways are subject to rapid deterioration from excessive dampness or other causes, open wiring may be inclosed by substantial wooden boxing, with an air space of one inch around the wires. Where boxing is used on vertical wires for part of the distance only, top of boxing shall be closed, and wires shall pass through holes bushed with approved non-absorptive, non-combustible insulating material.

(2) Trolley conductors and lightning arrester ground conductors are exempted from this order.

(2) All conductors in schools, theaters, assembly halls, hotels, hospitals and public garages shall be guarded by inclosure in rigid or flexible conduit, armored cable or metal raceways.

Exception: Wiring for lighting purposes, except lightning arrester ground conductors, in schools and assembly halls of frame construction may be of the concealed knob and tube construction.

(3) Conductors, except collector and trolley conductors, operating at voltages higher than 300 volts to ground shall be guarded by inclosure in conduit, in all buildings and at all elevations. (See also order 1357-g).

(4) Bus-bars and other open bare ungrounded conductors except collector and trolley conductors operating at voltages higher than 100 volts to ground, which are elevated less than eight feet above floor or platform, shall be inclosed by permanent guards.

(c) **Separation and Barriers.**
Bare parts at different potentials shall be effectively separated. Such parts in circuits of large capacity or more than 300 volts shall, unless provided with the inclosure or other guard specified in (a) above, be provided with suitable barriers, if otherwise they would be liable to be short circuited by tools or other conducting objects.

Order 1311. Working Space About Electrical Equipment.
(a) **General.** Suitable working space shall be provided and maintained about all electrical utilization equipment.

(b) **Minimum Dimensions.** The working spaces shall have minimum horizontal dimensions as follows:

(1) Equipment, operating above 150 volts to ground if on one side of working space, and no live or grounded parts on the other, 2.5 feet; if on both sides, 4 feet.

(2) **Equipment, operating below 150 volts to ground, if on one side of** working space and no live or grounded parts on the other, 1.5 feet; if on both sides, 2.5 feet.

(c) **Working Space Used as Passageway.**
Electrical utilization equipment shall not be placed adjacent to passageways or aisles, unless sufficiently removed therefrom that the above minimum working space dimensions may be maintained without encroaching on the passageways or aisles.

Order 1312. Hazardous Locations.
(a) **In Damp Places.**
(1) Current-carrying parts subject to moisture or corrosive vapors shall be enclosed in weatherproof cases.

(2) External parts of lighting fixtures, sockets or portable appliances when within 8 feet of the floor in damp locations, such as basements, foundries, laundries, bathrooms, kitchens, or when within 8 feet vertically and 5 feet horizontally in any location where persons may easily touch or stand upon grounded surfaces at the same time as they touch the equipment, shall be constructed of non-combustible non-absorbent insulating materials, if such external parts are not permanently and effectively grounded as required by order 1313-c.

(3) When installed at floor, outlets, attachment plug receptacles, etc., shall be inclosed in a moisture-proof outlet box.

(b) **Where Explosives and Inflammables Exist.** In locations where explosives, inflammable gas, or inflammable flyings normally exist in dangerous quantities, there shall be no exposed live parts. For enclosing live parts one or more of the following methods of protection shall be employed as may be required. (See also order 1346-i).

(1) When equipment is near inflammable material or when inflammable dust or flyings are present, casings of the inclosed type shall be used. All lamps shall be equipped with a vapor-tight globe and portable lamps with a substantial guard in addition.

(2) When equipment is located where explosive or inflammable vapors or gases exist in dangerous quantities, casings of the explosion-proof type shall be used; sockets and incandescent lamps shall be inclosed in vapor-tight globes, rigidly supported and wired with rubber-covered wire soldered directly to the circuit. Portable lamps shall not be used. All fittings and outlets shall be electrically and mechanically continuous with the conduit, and the conduit and fittings shall be sealed by effective means to prevent entrance of gases.

Order 1313. Grounding.
Grounding in accordance with methods set forth in Section 103 of Introductory Part is required for electrical utilization installations as follows:

(a) **Direct-Current Systems.**
(1) Three-wire direct-current systems operating at voltages less than 300 volts to ground shall always be grounded.

(2) Two-wire direct-current systems operating at voltages less than 300 volts to ground shall be grounded when the system is exposed to crosses from high-voltage lines.

(b) Alternating-Current Systems.
(1) All secondary distribution systems operating at voltages less than 300 volts to ground shall be grounded.

Exception: Electrical furnace circuits are exempted from grounding requirements.

(2) Secondary distribution systems supplying lighting service shall be grounded at each service entrance.

(c) Noncurrent-Carrying Metal Parts.
All exposed noncurrent-carrying metal parts of equipment operating at voltages above 100 volts to ground shall be bonded together and permanently and effectively grounded.

Exceptions: Grounding is not required for the following equipment:

1.—All equipment in locations where there are no exposed grounded surfaces within the reach of persons when touching the parts under consideration and where none of the conditions listed as hazardous in Order 1312 exist, and provided the voltage at which the equipment operates is less than 150 volts to ground.

2.—All equipment accessible only to qualified persons, provided it is effectively insulated from ground, provided insulating mats, platforms or floors are present, on which qualified persons may stand, and provided there are no exposed grounded surfaces within reach of said qualified persons, at such times as said qualified persons may be in contact with any live part.

3.—Cases of toy and bell-ringing transformers, cases of meters operating at less than 750 volts to ground, portable lamps and household appliances such as toasters, percolators, vacuum cleaners, etc., cases of transformers used exclusively to supply current to switchboard instruments installed and guarded in all respects as required for the higher voltage to which they are connected and name plates on switchboards and other apparatus.

Order 1314. Identification.
All electrical utilization equipment shall be suitably marked to indicate, the voltage, capacity, intended use and other essentials for safe operation.

SECTION 132. SERVICE ENTRANCE—INCLUDING SWITCH, FUSES, METER. CHARACTER OF SERVICE AND PROTECTIVE DEVICES.

Order 1320. Multiple Services.
(a) Separate Service to Each Building. Each building shall have a separate service, except when this is impossible or impracticable, and in the case of buildings of private plants not on opposite sides of a highway which may be interconnected with yard wires.

(b) More than one Service to Building. Where two services enter the same building, they shall be within three feet of each other.

Exception: Where this is impracticable means shall be provided for disconnecting all services at one readily accessible point.

Order 1321. Construction Requirements for Overhead Service Wires.
(a) Overhead Wires.
(1) Service wires shall be so placed that moisture cannot form a cross connection between them.

(2) Service wires shall be kept clear of awnings, branches of trees, or other objects.

(3) Where service wires are attached to building they shall be supported by insulators of proper type for outside use.

(b) Entrance Wires.
(1) Service wires operating at less than 750 volts, shall be enclosed in continuous rigid metal conduit from the first support on the outside of the building to the main switch and fuses.

Exception: Where service can be brought directly into the back of the main service cabinet, porcelain tubes slanting upward to the inside may be used.

(2) Conduit fittings equipped with non-combustible, non-absorptive insulating covers, with separate hole for each wire, slanting upward to the inside, shall be provided at the point of entrance of service wires.

(3) Entrance wires shall be so arranged as to prevent the entrance of water to the building.

(c) Insulating Covering of Wires. Service wires operating at less than 750 volts between the first support on the outside of the building and the main service cabinet shall have a rubber insulating cover; from the first support on the outside of the building to the supply line, they shall have a weatherproof insulating covering, except when run in conduit.

Order 1322. Construction Requirements for Underground Service Wires.
(a) Protection of Service Wires. Underground wires shall be insulated and protected against moisture and mechanical injury where brought into a building, and all combustible material shall be kept from the immediate vicinity.

(b) Sealing Service Tubes Against Gas. Where an underground service enters a building through tubes, the tubes shall be tightly closed at outlets with asphaltum or other non-conductor, to prevent gases from entering the building through such channels.

Order 1323. Connection to Street Series Circuits and Trolley Systems.
(a) Constant-Current Systems. Constant-current systems shall not be run into buildings to supply utilization equipment.

(b) Trolley Systems. Trolley circuits having a ground return shall not be run into buildings to supply utilization equipment.

Exception: (1) Railway cars, car houses, passenger and freight stations connected with the operation of electric railway systems are exempted from this order.

(2) Circuits for power equipment in buildings of so-called fireproof construction, and for light and power equipment in isolated buildings used in the operation of quarries and similar places are exempted from this order.

Order 1324. Switches, Fuses, and Circuit Breakers.
(a) Main Switch and Fuses Required. There shall be a main switch and fuses at the nearest readily accessible point of the basement or first floor where the service (either overhead or underground) enter the building.

(b) Must Cut-Off all Wiring. The switch, shall be arranged to cut off all wiring in the building and equipment connected to the service wires and the fuses shall protect all ungrounded service wires.

Exceptions: (1) Where the service switch, service fuses and meter are combined in a self-contained device, or compact combination of such devices, having no exposed wiring or live parts and having all other parts protected by fuses, potential coils may be connected on the supply side of the service fuses, and the switch need not be arranged to disconnect the fuses or meter from the supply line.

(2) Yard wires of private plants supplying more than one building not on opposite sides of the highway are not considered as service wires, so that fuses would not be required in each building; if there are other cut-outs, which afford proper protection, conveniently located on the mains.

(3) Service switches, employing a disconnected strap, in lieu of a switch blade, in the grounded neutral conductor of three wire services may be used, provided the service switch cabinet is sealed and accessible only to qualified persons.

(c) **Single Pole Switches.** Single pole switches shall not be used as service switches.

Exception: This order does not apply to the grounded circuits of street railway systems.

Order 1325. Services of 750-2500 volts.
(a) **General.** In addition to complying with the other orders of this section insofar as they apply, service wires operating at from 750-2500 volts shall comply with these additional requirements.

(b) **Entrance Wires.** High-potential service wires preferably should enter the building underground, but in all cases the service conduit shall pass directly into the cabinet or enclosure containing the main switch and automatic protective devices (fuses, circuit-breakers, automatic oil break switches).

Exception: Where the service can be brought directly into the back of the main service cabinet, properly insulating bushings slanting upward to the inside may be used.

(c) **Oil Service Switch and Disconnectors.**
(1) The service switch shall be of the oil immersed type and shall be so arranged that it can be disconnected from the supply lines by means of disconnectors or disconnecting pot-heads.

(2) If the service switch is of the automatic oil immersed type no fuses or circuit-breakers need be installed on load side of switch.

SECTION 133. CONDUIT, METAL SURFACE RACEWAYS, ARMORED CABLE.

Order 1330. Installation of Conduit. (Rigid Metal Pipe).
(a) **Minimum Size of Conduit.** Conduit smaller than ½ inch electrical trade size shall not be used.

(b) **Continuity Reaming and Supporting of Conduit.**
(1) Conduits shall be electrically and mechanically continuous from outlet to outlet or to junction boxes cut-out boxes or cabinets.

(2) Conduits shall be reamed and properly coupled and secured to all fittings and the entire system shall be mechanically secured in position.

(c) **Elbows and Bends in Conduit.**
(2) Conduits shall be reamed and properly coupled and secured to all fittings and the entire system shall be mechanically secured in position.

(c) **Elbows and Bends in Conduit.**
(1) All elbows or bends shall be so made that the conduit will not be injured; the radius of the curve of the inner edge of any elbow shall not be less than 3½ inches.

(2) Interior conduit shall have not more than the equivalent of four quarter bends from outlet to outlet.

(d) **Drainage of Conduit in Damp Places.** In damp places conduit shall be provided with suitable means for draining off condensation, unless the conductors contained are lead-sheathed cable.

(e) **Completion of Work.**
(1) Interior conduits shall be installed as a complete conduit system before the conductors are drawn in.

(2) Wires shall not be drawn in until all construction on that portion of the building has been completed.

(f) **Conduit Fittings.**
(1) All conduits shall be equipped at every outlet with an approved outlet box, plate, or other suitable conduit fitting. Outlet plates shall not be used where it is practicable to install outlet boxes. The box or plate shall be covered by a proper cover of fixture canopy.

(2) At exposed ends of conduit except at fixture outlets, where wires pass from the conduit system without splice, joint or tap, an approved fitting having separately bushed holes for each wire shall be used.

(3) All unused outlet openings in junction and outlet boxes, metal moulding, conduit, etc., shall be effectively closed with metal which will afford protection substantially equivalent to that of the wall of the junction or outlet box, etc.

(g) **Placing Outlets for Concealed Work.**
(1) For concealed work in walls and ceilings composed of plaster on wooden joist or stud construction, outlet boxers or plates and also cabinets shall be so installed that the front edge will not be more than ¼ inch back of the finished surface of the plaster, and if this surface is broken or incomplete it shall be repaired so that it will not show any gaps or open spaces around the edges of the oulet box or plate or of the cabinet.

(2) On wooden walls or ceilings outlet boxes or plates and cabinets shall be so installed that the front edge will be flush with the finished surface or project thereform.

(3) Outlet boxes and plates shall be securely supported.

(h) **Protection of Wires at Outlets.** Metal conduits where they enter junction boxes, outlet boxes or wherever else they may terminate, shall be provided with proper terminal fittings, bushings or fastening plates fitted so as to protect wire from abrasion, except when such protection is obtained by the use of approved nipples, properly fitted in boxes or devices, or by the junction or outlet boxes themselves.

(i) **Accessibility of Cabinets and Junction Boxes.** Cabinet and junction boxes shall always be installed in such a manner as to be accessible.

Order 1331. Capacity of Conduits.
(a) **Number of Wires Permitted.** Wires installed in conduits shall conform to Tables I and II.
Insert table I page 160

TABLE I.

Size of Conductor A. W. G. or Circular Mils.	Number of Conductors ermitted in One Conduit								
	1	2	3	4	5	6	7	8	9
	Minimum Size of Conduit in Inches (Electrical Trade Size)								
14	½	½	½	¾	¾	1	1	1	1
12	½	½	¾	¾	¾	1	1	1	1¼
10	½	¾	¾	1	1	1	1¼	1¼	1¼
8	½	¾	1	1	1	1¼	1¼	1¼	1¼
6	½	1	1¼	1¼	1½	1½	2	2	2
5	¾	1¼	1¼	1¼	1½	2	2	2	2
4	¾	1¼	1¼	1½	2	2	2	2	2½
3	¾	1¼	1¼	1½	2	2	2	2½	2½
2	¾	1¼	1½	1½	2	2	2½	2½	2½
1	¾	1½	1½	2	2	2½	2½	3	3
0	1	1½	2	2	2½	2½	3	3	3
00	1	2	2	2½	2½	3	3	3	3½
000	1	2	2	2½	3	3	3	3½	3½
0000	1¼	2	2½	2½	3	3	3½	3½	4
200,000 c. m.	1¼	2	2½	3	3	3	3½	3½	4
225,000 c. m.	1¼	2½	2½	3	3	3½	3½	4	4
250,000 c. m.	1¼	2½	2½	3	3	3½	3½	4	4½
300,000 c. m.	1¼	2½	3	3	3½	3½	4	4½	4½
350,000 c. m.	1¼	2½	3	3½	3½	4	4½	4½	5
400,000 c. m.	1¼	3	3	3½	4	4	4½	5	5
450,000 c. m.	1½	3	3	3½	4	4½	4½	5	6
500,000 c. m.	1½	3	3	3½	4	4½	5	5	6
550,000 c. m.	1½	3	3½	4	4½	5	5	6	6
600,000 c. m.	2	3	3½	4	4½	5	6	6	6
650,000 c. m.	2	3½	3½	4	4½	5	6	6	6
700,000 c. m.	2	3½	3½	4½	5	5	6	6	...
750,000 c. m.	2	3½	3½	4½	5	5	6	6	...
800,000 c. m.	2	3½	4	4½	5	6	6	6	...
850,000 c. m.	2	3½	4	4½	5	6	6	...	...
900,000 c. m.	2	3½	4	4½	5	6	6	...	...
950,000 c. m.	2	4	4	5	5	6	6	...	...
1,000,000 c. m.	2	4	4	5	5	6	...	...	...
1,100,000 c. m.	2½	4	4½	6	6	...	...	...	...
1,200,000 c. m.	2½	4½	4½	6	6	...	...	...	...
1,250,000 c. m.	2½	4½	4½	6	6	...	...	...	...
1,300,000 c. m.	2½	4½	5	6	6	...	...	...	...
1,400,000 c. m.	2½	4½	5	6	...	...	...	...	...
1,500,000 c. m.	2½	4½	5	6	...	...	...	...	...
1,600,000 c. m.	2½	5	5	6	...	...	...	...	...
1,700,000 c. m.	3	5	5	6	...	...	...	...	...
1,750,000 c. m.	3	5	5	6	...	...	...	...	...
[illegible] c. m.	3	5	6	6	...	...	...	...	...
1,900,000 c. m.	3	5	6	...	...	...	...	...	...
2,000,000 c. m.	3	5	6	...	...	...	...	...	...

Note: For 10 A. W. G. or less one more conductor than permitted by the above table may be installed in the specified conduit, provided the conduit is not longer than 30 feet, and has not more than the equivalent of two quarter bends from outlet to outlet, the bends at the outlets not being counted.

TABLE II.

Sizes of Wires—A. W. G.		Size of Conduit Electrical Trade Size—Inches
two 14 and one No.	10	¾
two 12 and one No.	8	¾
two 10 and one No.	6	1
two 8 and one No.	4	1
two 6 and one No.	2	1¼
two 5 and one No.	1	1¼
two 4 and one No.	0	1½
two 3 and one No.	00	1½
two 2 and one No.	000	1½
two 1 and one No.	0000	[illegible]
two 0 and one	250,000 c. m.	2
two 00 and one	350,000 c. m.	2½
two 000 and one	400,000 c. m.	2½
two 0000 and one	550,000 c. m.	3
two 250,000 and one	600,000 c. m.	3
two 300,000 and one	800,000 c. m.	3
two 400,000 and one	1,000,000 c. m.	3½
two 500,000 and one	1,250,000 c. m.	4
two 600,000 and one	1,500,000 c. m.	4
two 700,000 and one	1,750,000 c. m.	4½

Note: These tables apply only to complete conduit systems and do not apply to short lengths of conduit for the protection of exposed wiring from mechanical injury.

(b) **Number of Circuits Permitted.** Except in the case of stagepockets, border circuits, and outside signs and outline lighting, the same conduit shall not contain more than four two-wire or three three-wire circuits of the same system, and shall never contain circuits of different systems.

Order 1332. Installation of Armored Cables and Flexible Conduit.
(a) Compliance with Other Orders. Installation of armored cables and flexible conduit shall comply with the general requirements for conduits insofar as they apply and to these additional requirements:

(b) Damp Locations. In damp places or when laid in concrete, armored cable or flexible conduit shall have a lead covering placed between the outer braid of the wires and the steel armor.

(c) Bends. All bends shall be so made that the armored cable or flexible conduit will not be injured.

Order 1333. Installation of Surface Metal Raceways.
(a) Location. Metal raceways may be used only for surface wiring in dry locations.

(b) Continuity. Metal raceways shall be continuous from outlet to outlet, to junction boxes, or approved fittings designed especially for use with metal raceways, and shall at all outlets be provided with approved terminal fittings which will protect the insulation of wires from abrasion, unless such protection is afforded by the construction of the boxes or fittings.

(c) **Where Passing Through Floors or Partitions.**
(1) Where metal raceways pass through a door, they shall be carried through an iron pipe, extending from the ceiling below to a point five feet above the floor.

Exception: Where the mechanical strength of the raceway itself is adequate this ruling may be modified to require the protecting piping from the ceiling below to a point at least three inches above the flooring.

(2) Where metal raceways pass through a partition they shall be carried through an iron pipe extending three inches beyond the partition on each side.

Exception: Where such raceways pass through a partition the iron pipe required may be omitted and the raceway passed directly through, providing the partition is dry and the raceway is in a continuous length with no joint or or coupling within the partition.

(d) **Screws and Bolts.** The heads of screws or bolts placed within the raceways shall be flush with the metal.

(e) **Number of Circuits.** Not more than four No. 14 A. W. G. rubber-covered wires, and no single circuit of more than 1320 watts shall be used in a metal raceway.

SECTION 134. INSTALLATION AND PROTECTION OF WIRES FOR LIGHTING AND POWER SERVICE BELOW 750 VOLTS

(Signal wires and radio signalling apparatus are covered separately in section 139).

Order 1340. General.
(a) **Identification of Wires.**
(1) The grounded wire of all branch circuits and all equipment ground wires shall have an identifying insulating covering, readily distinguishing it from other wires.

Exception: Such grounded conductors of existing installations may be identified by another effective method, such as by means of tags.

(2) Such identified grounded wires of branch circuits shall be run without transposition throughout the entire installation and properly connected at all fittings to properly identified terminals in order to preserve continuity.

(b) **Bare Wires.**
(1) Bare conductors shall be used only for switchboard, panelboard, or storage battery connections; or for electrolytic and low voltage welding circuits and similar connections; or for trolley wires, third rails, crane runway wires, and other contact conductors and parts.

(2) Such bare conductors shall be fixed at adequate separations by the use of suitable supports.

(3) Except at the point where a permanent ground connection is made, such conductors within buildings shall be kept insulated from the ground.

(c) **Twin Wires.** Twin wires shall not be used except in conduits, armored cable, metal raceways, or flexible cords.

(d) **Avoidance of Excessive Inductance.** The two or more wires of an alternating-current circuit, if to be run in metal raceways, or conduit or other magnetic metal casing shall be installed within the same metal casing. The two or more wires shall not be run on opposite sides of I-beam or other iron or steel structures or in any manner so as to abnormally increase the inductance of the circuit.

(e) **Splices and Connections.**
(1) Wires shall be so spliced or jointed as to be both mechanically and electrically secure without solder. The joints shall then be soldered unless made with some form of approved splicing device and then covered with an insulation equal to that on the wires.

(2) Stranded wires shall be soldered before being fastened under clamps or binding screws and whether stranded or solid, when No. 8 A. W. G. or larger they shall be soldered into lugs for all terminal connections, except where an approved solderless terminal connector is used.

(f) **Rheostat Connections.**
(1) Wherever insulated wire is used for connections between resistors and the contact device of a rheostat, the insulation shall be non-combustible or slow-burning.

(½) For large rheostats and similar resistances where the contact devices are not mounted upon them, the connecting wires having slow burning insulation may be so arranged in groups that the maximum difference of potential between any two wires in any group shall not exceed 75 volts. Each group of wires will be mounted on noncombustible, nonabsorptive insulators giving at least ½ inch separation from surface wired over, or where it is necessary to protect them from mechanical injury, each group of wires may be incased in flexible tubing and placed in conduit, the flexible tubing to extend at least one inch beyond the end of the conduit.

Order 1341. Carrying Capacities of Wires and Sizes of Wires Required.
(a) **General Table.**
The following table. (Table III) showing the allowable carrying capacity of copper wires and cables of ninety-eight per cent conductivity, according to the standard adopted by the American Institute of Electrical Engineers shall be followed in [illegible] wires

TABLE III—ALLOWABLE CARRYING CAPACITIES OF WIRES

A. W. G. Number	Diameter of Solid Wire in Mils.	Area Circular Mils.	Column A Rubber Insulation Amperes	Column B Varnished Cloth Insulation Amperes	Column C Other Insulation Amperes
18	40.3	1,624	3		5
16	50.8	2,583	6		10
14	64.1	4,107	15		20
12	80.8	6,530	20		25
10	101.9	10,380	25		30
8	128.5	16,510	35		50
6	162.0	26,250	50	60	70
5	181.9	33,100	55	65	80
4	204.3	41,740	70	85	90
3	229.4	52,630	80	95	100
2	257.6	66,370	90	110	125
1	289.3	83,690	100	120	150
0	325.0	105,500	125	150	200
00	364.8	133,100	150	180	225
000	409.6	167,800	175	210	275
		200,000	200	240	300
0000		211,600	225	270	325
		250,000	250	300	350
		300,000	275	330	400
		350,000	300	360	450
		400,000	325	390	500
		500,000	400	480	600
		600,000	450	540	680
		700,000	500	600	760
		800 000	550	660	840
		900,000	600	720	920
		1,000,000	650	780	1,000
		1,100,000	690	830	1,080
		1,200,000	730	880	1,150
		1,300,000	770	920	1,220
		1,400,000	810	970	1,290
		1,500,000	850	1,020	1,360
		1,600,000	890	1,070	1,430
		1,700,000	930	1,120	1,490
		1,800,000	970	1,160	1,550
		1,900,000	1,010	1,210	1,610
		2,000,000	1,050	1,260	1,670

Note: For insulated aluminum wire the safe carrying capacity is eighty-four per cent of that given in these tables for copper wire with the same kind of insulation.

(b) **Minimum Size Branch Circuit Wires.** Wires shall not be smaller than No. 14 A. W. G. except as allowed for fixture work, flexible cords, and signal work.

Note. Where wire sizes in these rules are specified it shall be understood that copper wire is referred to. If wire of other material is used, it shall have a carrying capacity equivalent to copper of the size specified.

(c) **Alternating Current Motor Circuits.**

(1) Conductors supplying current to one motor shall be of sufficient size to safely carry the starting current of the motor but in no case shall the capacity be less than 110 per cent of the current rating of the motor. Such conductors may be:

(1) Conductors supplying current to one motor shall be of sufficient size to safely carry the starting current of the motor but in no case shall the capacity be less than 110 per cent of the current rating of the motor. Where the branch circuit is protected by fuses, the rated capacity of the fuses shall not exceed the carrying capacity of the conductors as given in Table III, except that the carrying capacities of Column c, Table III, may be applied to rubber covered wire used to serve motors of a type of large starting current.

(2) Conductors in that part of the circuit leading from the motor running fuses or circuit breaker to the motor, are considered as being included in the protection afforded by such motor running overload protective device, even though such protective device be shunted or cutout of circuit during the starting period. The minimum size of the conductors in this portion of the circuit shall, therefore, be determined from Table 3, applying to the kind of insulation used and in accordance with the rating of the fuses or setting of the circuit breaker provided for the running overload protection of the motor, except that in no case shall such conductors have a capacity less than 110 per cent of the motor rating.

(3) Conductors supplying a group of motors shall be of a size sufficient to carry the total load imposed upon them. Such conductors shall not be fused greater than 110 per cent of the rated carrying capacity of the wires, as given in Table III above.

(d) **Direct Current Motor Circuits.**

(1) All conductors supplying current to a single motor shall have a current-carrying capacity sufficient to safely carry 110 per cent of the full load current without overfusing the wires.

(2) Conductors supplying a group of motors shall be of a size sufficient to carry the total load imposed upon them. Such conductors shall not be a fuse greater than the rated carrying capacity of the wires as given in table III above.

(e) **Trolley Wires.** Trolley or collector wires including crane runway wires shall be large enough to safely carry the current to be carried and to stand the strain put upon them when in use.

(f) **Size of Neutral.** In three-wire direct current or single phase alternating-current systems the neutral shall be of sufficient capacity to carry the maximum current to which it may be subjected.

(g) **Fixture Wire.** Fixture wires shall not be smaller than No. 18 A. W. G.

(h) **Flexible Cords.** Each conductor shall not be less than No. 18 A. W. G.

Order 1342. Wiring in Conduit Raceways and Armored Cable.

(a) **Conduit Wiring.**

(1) For conduit work wires shall have rubber insulating coverings, for all purposes, except that where excessive temperatures are present slow-burning insulation shall be used.

Exception: Varnished cloth insulation may be used in permanently dry locations for wires of No. 6 A. W. G. or larger.

(2) Within conduit wires shall be without splices or taps.

(3) For conduit work, wires shall be double-braided for twin, twisted pair or multiple-conductor cables and for all single wires of No. 6 A. W. G. and larger.

(4) Where conduit is used to protect wires on or passing through side walls, the insulation of each wire shall be reinforced by approved flexible tubing extending from the insulator next below the conduit to insulator next above the conduit, unless the conduit is installed in accordance with orders 1330 and 1331 and the wire is approved for conduit use. (See also order 1343-i and l.)

(b) **Support of Vertical Conduit Wiring.**

(1) Wires in vertical conduit risers shall be supported within the conduit system in accordance with the following table:

No. 14-A. W. G. to 0-A. W. G. inclusive every 100 feet.
No. 00-A. W. G. to 0000-A. W. G inclusive, every 80 feet.
Above 0000-A. W. G. to 350,000-C. M. inclusive, every 60 feet.
Above 350,000-C. M. to 500,000-C. M. inclusive, every 50 feet.
Above 500,000-C. M. to 750,000-C. M. inclusive, every 40 feet,
Above 750,000-C. M. every 35 feet,

(2) Any of the following methods of support shall be used:

I. Approved clamping devices constructed of or employing insulating wedges inserted in the ends of conduits.

II. Junction boxes with covers inserted in the conduit system at the required intervals, in which insulating supports of approved type are installed and secured in a satisfactory manner so as to withstand the weight of the wires attached thereto.

III. Junction boxes with covers in which wires are supported on two or more insulating supports so placed that the conductors will be deflected at an angle of not less than 90 degrees, and carried a distance of not less than twice the diameter of the wire from its vertical position, and where necessary wires are additionally secured to these insulators by tie wires.

(c) **Wires Entering Cabinets.** Wires of No. 2 A. W. G. or larger shall not be deflected where they enter or leave cabinets, except in wiring gutters.

(d) **Surface-Wiring Metal-Raceways.**

(1) Wires shall have rubber insulating coverings, with at least one braid for wires smaller than No. 6 A. W. G. and two braids for wires No. 6 A. W. G. and larger and for twin wires.

(2) Wires shall be in continuous lengths from outlet to outlet, or from fitting to fitting with no joints or taps in the raceway.

(3) Where branch taps are necessary in wiring raceways, proper fittings for the purpose shall be used.

(4) Wires shall never be placed in metal raceways in damp locations, in concealed locations, or where the difference of potential between any two wires in the same system is over 300 volts.

(e) **Armored Cable.**

Wires shall have rubber insulating covering meeting the requirements for rubber-covered wires or cords of the specified types and construction.

Order 1343. Open Wiring and Concealed Knob and Tube Work.

(a) **Insulation of Wires.**

(1) Wires for open work in dry places shall have rubber, slow-burning weatherproof, varnished cloth or slow-burning, insulating coverings. When especially subject to acid fumes or corrosive vapors, either slow-burning weatherproof, varnished cloth or rubber insulating coverings shall be used.

(2) Wires for concealed work or in damp places shall have rubber insulating covering, which shall be double braided for wires No. 6 A. W. G. and larger.

(b) **Wires in Plaster, etc.** Wires shall not be laid directly in plaster, cement or similar materials.

(c) **Wires in Attic.** Wires in unfinished attics or roof spaces shall not be run on knobs or cleats on upper edges of joists.

(d) **Support of Wires in Open Work.**

(1) Wires shall be rigidly supported on non-combustible non-absorbtive insulators, which will separate wires from each other and from the surface wired over in accordance with the following table:

Voltage		Distance from Surface	Distance Between Wires
0-300	In dry places	½ inch	2½ inches
0-300	In damp places or where subject to corrosive vapors	1 inch	2½ inches
300-750		1 inch	4 inches

(2) Where wiring over flat surfaces, wires shall be supported at least every four and one-half feet. If the wires are liable to be disturbed, the distance between supports shall be shortened. In buildings of mill and similar construction, mains of not less than No. 8 A. W. G., where not liable to be disturbed, may be separated about six inches and supported at each timber only, but the maximum span shall not exceed 8 feet.

(3) Wires for open work dead-ended at a rosette, socket or receptacle shall have a support within twelve inches of the same.

(4) Wires crossing overhead floor timbers in rooms where they may be exposed to injury, shall be attached by their insulating supports to the under side of a wooden strip not less than one-half inch in thickness, and six inches in width (5) In large interiors where it is advantageous to run wires through space, unsupported except at ends, the following conditions shall be observed:

I. Wires must be elevated at least 16 feet and not subject to mechanical injury.

II. Spans must not exceed 75 feet for No. 8 A. W. G. wire or 125 feet for No. 6 A. W. G. or larger wire.

III. Wires shall not be smaller than No. 8 A. W. G. wire.

IV. Wires shall be supported at ends by strain insulaters

(e) **Support of Wires in Concealed Work.**

(1) Wires for concealed work shall be rigidly supported on non-combustible, non-absorptive insulators, at least every four and one-half feet, which separate the wire at least one inch from the surface wired over.

(2) Wires shall be kept at least five inches apart.

(3) Split knobs may be used for wires of No. 10 A. W. G. and smaller only.

(f) **Tying of Wires.**

(1) Wires of No. 8 A. W. G. or larger used with solid knobs shall be securely tied thereto with wires which have an insulation of the same type as that of the wires tied.

(2) Tie wire shall be of same size as wire tied, except that it need not exceed No. 6 A. W. G. in size.

(g) **Fastening of Knobs and Cleats.** Knobs or cleats, which are arranged to grip the wire, shall be fastened by screws, or barbed or cement coated nails with leather washers. If nails are used, they shall penetrate the wood for a distance of at least one-half the depth of the knob or cleat.

(h) **Flexible Tubing.**

(1) Wires at distributing centers, meters, switches, or other places where space is limited and the proper separation of wires cannot be maintained, or when fished shall be separately encased in a continuous length or flexible tubing, extending from support to support. (See also 1-1 below.)

(2) At all outlets in concealed knob-and-tube work, wires shall be protected by approved flexible tubing, extending in continuous lengths from the last non-combustible non-absorptive insulating support to at least one inch beyond the outlet.

(3) In the case of combination gas and electric outlets, the tubing on the wires shall extend at least flush with the lower end of gas caps.

(4) Wires may be fished only in places where suitable inspection can be made to assure that the work is in compliance with this code.

(i) **Wires Passing through Walls and Floors.**

(1) Wires in open work shall be separated from contact with walls, floors, timber or partitions through which they may pass by non-combustible, non-absorptive, insulating tubes, such as porcelain or glass, except at outlets where approved flexible tubing is required. (See h-2 above.) (Such bushings shall be long enough to bush the entire length of the hole in one continuous piece.

(2) Wires for concealed work shall be separated from walls, floors, timbers, and partitions, through which they may pass by non-combustible, non-absorptive, insulating tubes, such as porcelain or glass. Wires passing through cross timbers in plastered partitions shall be protected by an additional tube, extending at least four inches above the timber.

(j) **Clearance from other Wires or Pipes.**

(1) Wires of any circuit coming within two inches of other light, power or signal circuits, shall be permanently separated therefrom by a continuous and firmly secured, non-conducting material in addition to the insulation on the wires.

(2) Wires crossing pipes shall be protected in the same manner as called for in paragraph (1) above.

(3) Wires crossing pipes in wet places shall be protected as called for in paragraph (1) above, and in addition shall be kept at least two inches from such pipes.

(k) **Wires Entering Cabinets, etc.** Where entering cabinets, cut-out boxes or junction boxes, except where they are in conduit, armored cable or metal raceways, wires shall be protected by non-combustible, non-absorptive, insulating bushings which fit tightly into the holes in the box or cabinet and are well secured in place.

(l) **Mixed Work.**

(1) When, in concealed knob-and-tube work, it is impracticable to place the whole of a circuit on non-absorptive, non-combustible insulating supports, that portion of the circuit which cannot be so supported shall be installed with metal conduit or armored cable, except that if the difference of potential between the wires is not over 300 volts and wires are not exposed to moisture, they may be fished when separately encased in flexible tubing, extending in continuous lengths from support to support, from support to outlet, or from outlet to outlet.

(2) When using either conduit or armored cable in mixed concealed knob-and-tube work, the requirements for conduit work or armoured cable work shall be complied with as the case may be. Proper fitting having a separate bushed hole for each wire shall be used for terminating the conduit or armored cable.

(m) **Outlet Boxes or Plates and Fixture Studs Required.**

(1) Outlet boxes or plates shall be installed at all outlets in concealed knob and tube wiring for lighting. Outlet plates shall not be installed where it is practicable to install outlet boxes. The box or plate shall be covered by a proper cover or fixture canopy.

(2) Adequate supports for fixtures shall be installed at all straight electric lighting outlets.

(3) At outlets for combination gas and electric fixtures pipes shall be fastened to boxes or plates so as to secure good electrical contact.

(4) Outlet boxes and plates shall be supported as required by order 1330-g.

(n) **Broken Surface at Outlets.** When the surface at any outlet is broken, all holes or open spaces shall be repaired.

Order 1344. Insulation Requirements for Wiring. The wiring of an installation shall comply with the following requirements:

(1) The complete installation and any portion thereof with all cut-outs and safety devices in place, shall have a resistance between wires and between all wires and the ground (not including attachments, sockets, receptacles, etc.) not less than that given in the following table:

Up to 5 amperes	4,000,000 ohms
Up to 10 amperes	2,000,000 ohms
Up to 25 amperes	800,000 ohms
Up to 50 amperes	400,000 ohms
Up to 100 amperes	200,000 ohms
Up to 200 amperes	100,000 ohms
Up to 400 amperes	50,000 ohms
Up to 800 amperes	25,000 ohms
Up to 1600 amperes	12,500 ohms

(2) When the lamp sockets, receptacles, electroliers, etc., are also connected, one-half of the resistance specified in the table will be required.

Order 1345. Wiring of Car Houses and Car Storage Yards.

(a) **Trolley Wires.**

(1) The trolley wires shall be securely supported on suitable insulating hangers, designed for the voltage used, and shall be placed at such a distance apart that the distance between any two hangers is less than the distance from the trolley wire to the floor or rail.

(2) Wood troughing or sufficient protection to prevent trolley pole forming a contact with any metal part of the building shall be provided.

(b) **Cut-Out Switch and Line Breakers.**

(1) An emergency cut-out switch in an accessible location outside of the building, arranged so that all trolley wires in the building may be cut at one point, shall be provided. Line insulators shall be installed so that when the emergency switch is open, the trolley wire leading into the building will be dead at all points, within at least 50 feet of the buildings. In car houses not used as operating stations, the current shall be cut out of the building when not needed for use in the building.

(2) Trolley wires in car storage yards, or distinctive sections of a large storage yard shall be controlled by an emergency cut-out switch, as described above. Yards in conjunction with car houses shall be treated as a separate section and have auxiliary cut-out switch.

(3) When car house or car storage yard is divided into fire sections auxiliary cut-out switches shall be arranged to control each section independently and may be located inside of building near track entrance.

(c) **Lightning Arresters.** Approved lightning arresters shall be installed to adequately protect all overhead trolley wires in car houses and car storage yards inside of the line insulators (breakers).

(d) **Current Collectors to be Disconnected.** Current collectors shall be removed from contact with trolley wires when cars are not in use.

(e) **Bonding of Rails.** All rails shall be bonded at each joint with a conductor having a carrying capacity at least equivalent to No. 0-A. W. G. annealed copper wire, and all rails shall be connected to the outside ground return circuit by not less than No. 0-A, W. G. copper wire, or by equivalent bonding through the track.

(f) **Third Rails.**

(1) Power third rails shall be rigidly supported on suitable insulating supports and properly bonded at joints.

(2) Power rails within each fire section of building or storage yard shall be controlled by an emergency cut-out switch located in a readily accessible place outside of buildings.

(g) **Control of Lamps and Stationary Motors.** All lamps and stationary motors shall be installed in such a way that one main switch controls the whole of such installation, lighting and power, independently of cut-out switch called for in (b) above.

(h) **Wiring of Apparatus.**

(1) All wiring and apparatus shall be installed in accordance with the orders of the other sections of this code.

(2) When current for lighting, stationary motors, heating, testing apparatus, etc., is from a grounded trolley circuit, the following special rules shall apply:

I. Voltage for light, heat, or power shall not exceed 750 volts.

II. Approved cut-outs and switches shall be placed in the non-grounded side of light and motor circuits they are to protect. Light circuits shall not have more than 2,000 watts, depending upon a single cut-out.

III. Drops to lights shall be flexible rubber covered wire or packing house cable.

IV. In series systems sockets shall be of the weatherproof or porcelain keyless type and a voltage rating for the current used.

V. The main ground, or return wire, shall connect with the rails or negative feeder at not less than two places and shall be protected against mechanical injury.

VI. All cut-outs and switches in grounded systems shall be installed in cabinets of non-conducting material. If wooden cabinets are used, they shall be lined with ¼ inch fire-resisting insulating material and painted with a non-conducting paint.

VII. All portable testing, lighting and power devices and all pendant cords and portable conductors shall be constructed to withstand hard usage.

VIII. Controlling devices and apparatus for feeder distribution systems for outside distribution shall be installed in a fire-resisting room or compartment.

Order 1346. Portable and Flexible Cords.

(a) **Show Windows.** Portable cords shall not be used in show windows or in show cases, unless provided with metal armor.

Exception: Portable cord may be used for the purpose of supplying current to portable lamps and other devices for exhibition purposes.

(b) **Voltage Limit.** Portable and pendant conductors except in electric railway property, shall not be used where the voltage between wires is over 300 volts.

Exception: Portable cords for portable or movable motors for grinding and other uses, operating between 300 and 500 volts to ground may be used if the following construction requirements are complied with:

(1) Portable cord shall be flexible steel-armored lead-covered cable, carry-parts shall be grounded in accordance with requirements for grounding of section 103, Introductory Part.

(2) Steel armor of portable cord and all other exposed non-current-carrying parts shall be grounded in accordance with requirements for grounding of section 103, Introductory Part.

(3) There shall be no exposed live parts of wall receptacles, and such receptacles shall be located at least 5 feet above the floor. Floor receptacles shall not be used.

(4) Wall receptacles shall be of a distinctive type, not interchangeable with ordinary receptacles of the lighting system.

(5) Plug connectors shall be arranged so that they can be inserted in receptacles in one position only, thereby insuring against wrong connection of ground required above.

(c) **Use of Flexible Cords.** The use of flexible cords shall be limited to wiring pendants such as single lamps (not clusters), portable equipment and chain fixtures.

(d) **Cord for Portable Work.** For all portable work, cords, especially suited for the purpose, shall be used.

(e) **Strain at Connections.** Portable and pendant conductors shall be so installed that no strain can be placed on the terminal connections and shall have no joints except at suitable fittings.

(f) **Receptacles for Portable Attachments.** Receptacles shall be located at safely accessible places with the more exposed conducting part connected to the grounded side of the circuit. They shall be so located that liability of such conductors being brought into dangerous proximity with other live parts will be minimized.

(g) **Connectors for Portable Cords.** Connectors which disconnect all poles from the live source of energy by a single operation shall be used.

(h) **Guarding Live Parts of Connectors.**

(1) Connectors shall be so constructed (with guards when necessary) that the person using them cannot inadvertently come in contact with live parts, or be burned by arching, when interrupting the circuit.

(2) The ends of a separable connector which are left alive, shall have live parts suitably guarded.

(i) **Connectors in Hazardous Locations.** Where connectors are exposed to inflammable gas or flyings they shall be so arranged as not to be exposed to accidental opening by persons handling portable conductors or devices.

(j) **Design of Separable Connectors.** Separable connectors shall be so designed that the plugs will not fit receptables rated for larger currents than the plugs, and shall be of the polarity type.

(k) **Protection of Cord at Sockets.** Flexible cord where entering sockets shall be protected by approved insulating bushings, which, if threaded, shall not be smaller than ⅜ inch pipe size.

(l) **Protection of Cord at Outlet Boxes.** Where passing through covers of outlet boxes, flexible cords shall be protected by bushings especially designed for this purpose, or the cover must be provided with a smooth, well-rounded surface on which the cord will bear. So-called hard rubber or composition bushings may not be used.

SECTION 135. SWITCHES, FUSES, CIRCUIT-BREAKERS, CABINETS, SWITCHBOARDS, CONTROLLERS, TRANSFORMERS, MOTORS, GENERATORS, CRANES.

Order 1350. General Requirements for Switches.

(a) **Where Switches are Required.**

(1) Switches shall be installed at as many points of any distribution system as may be required to make possible the disconnection of individual parts or pieces of apparatus from the source of power.

Exception: (1) Parts or pieces of utilization equipment intended to operate as a unit, as for instance a motor and its starting device, may be controlled by one switch.

(2) An automatic circuit-breaker complying with order 1351-f-3 may serve as a switch for motors if it disconnects all wires of the circuit.

(3) Utilization equipment having a capacity less than 1500 watts may be disconnected by plug connectors, arranged as required by order 1346-g-h-i and j.

(2) There shall always be a switch for disconnecting motor starter, including switches used as starters, from the supply circuit.

Exception: One switch may serve to disconnect the supply circuit in several motor starters if within sight of the motors controlled.

(b) **Switches to be Readily Accessible.**

(1) All switches shall be readily and safely accessible and shall be installed in such a manner as to minimize the danger of accidental operation.

(2) With motor-driven equipment, heaters and furnaces, switches shall be within sight of the equipment controlled by such switch.

(c) **Switches to be Indicating.** When controlling circuits of capacity greater than 1320 watts, switches shall be so located or marked as to indicate their function, the location and character of equipment controlled by them and whether they are open or closed.

(d) **Switches Required to Disconnect all Wires.** Switches shall open all conductors of the circuit by one operation.

Exception: Except for outline lighting, single-pole, three-way and four-way switches may be used in two-wire branch circuits, of capacity as limited by order 1352-b, if placed in the ungrounded conductor except for outline lighting.

(e) **Switches to be Capable of Opening under Load.**

(1) Switches shall preferably be capable of breaking 150 per cent of the full load current of the connected apparatus at the rated voltage.

(2) If switches are not capable of breaking 150 per cent of the full load current as required above, they shall be so constructed that they may be locked in the closed position, or they shall be so located that they are not accessible to other than qualified persons.

(f) **Motor Starting Switches.** Where a switch is used to shunt the fuses or other motor protective devices during the starting period, it shall be of such type that it will be held in off and running positions, but cannot be left in the starting position without the proper running overload protective devices in circuit.

(g) **Switches for Temporary Wiring.** Switches or plug connectors shall be placed in all circuit leads at the point where temporary wiring is connected to the permanent wiring.

(h) **Guarding Live Parts of Switches.**

All manual switches, including service entrance switches, shall have suitable casings or inclosures of such design as to permit of operation without opening the inclosure and so that the operator is at all times protected against danger. Cases shall be locked, sealed or made inaccessible, to other than qualified persons, by other suitable methods.

Exception: Switches on switchboards and panelboards which are guarded as required by order 1310, are exempted from this order. Panelboards complying with order 1354-b need not be installed in locked cabinets. Single-pole, three-way and four-way switches for use in two-wire branch circuits are not included under this order.

(i) **Locking of Switches.** Means shall be provided so that switches for disconnecting motors, storage batteries, transformers, electric furnaces, and similar utilization equipment can be locked in the open position to prevent careless closing while work is being done on the equipment controlled by them.

Exception: (1) Small capacity snap or push switches, and push buttons of remote control switches if near machines and in plain sight from all parts of the machines controlled, are exempted.

(2) Switches of any size are exempted if the installation comprises only one motor, and the switch is in plain sight from all parts of the machines operated by the motor.

(3) Open switches in rooms made inaccessible to other than qualified persons may be arranged to be blocked in the open position and plainly tagged.

(j) **Disconnectors.** Disconnectors shall be accessible only to properly qualified persons. They shall also be protected by signs warning against opening the disconnectors while carrying current.

(k) **Switch Blades to be Dead.** Switches shall be so wired that blades will be dead when switch is open.

Exception: Double-throw switches are exempted from this requirement.

(l) **Contact and Blade Requirements.**

(1) Switches shall be so constructed as to make and maintain good contact.

(2) Knife switches shall maintain such alignment under service conditions that they may be closed with a single unhesitating motion.

(m) **Clearances and Arrangements.**

(1) Where a number of switches are installed in one location they shall be grouped in an orderly manner.

(2) When in cabinets, live metal parts shall have clearances from metal walls and doors as specified in order 1353.

(3) Single-throw knife switches shall be so placed that gravity will not tend to close them.

(4) Double-throw knife switches when mounted in the vertical position shall have a locking device so constructed as to insure the blades remaining in the open position when so set.

(n) **Flush Switches—(Snap or Push).** Where flush switches or receptacles are used, whether with conduit or not, they shall be inclosed in a box constructed of iron or steel, in addition to the porcelain enclosure of the switch or receptacle.

(o) **Support of Surface Snap Switches in Concealed Wiring.** Switches shall be supported at outlets by approved fittings or outlet boxes giving proper support or by 3x¾ inch block fastened between studs. When this cannot be done, base blocks not less than ¾ inch in thickness securely screwed to the lathing shall be provided.

(p) **Sub-bases for Snap Switches in Open Wiring.** Sub-bases of non-combustible, non-absorptive insulating materials, which will separate the wires at least ½ inch from the surface wired over, shall be installed under all snap switches used in exposed knob and cleat work. Sub-bases shall also be used in metal raceway work, but they may be made of hardwood or they may be omitted if the switch is approved for mounting directly on the metal raceway.

(q) **Time Switches.** Time switches, sign flashers and similar appliances shall be of approved design and inclosed in approved cabinets, except sign flashers on or within the body or structure of the sign, in which case they shall be in separate, completely inclosed, accessible weatherproof boxes or cabinets of metal, of thickness not less than that of the metal of the sign itself.

(r) **Compliance with Other Orders.**

1. Cranes. For additional requirements for switch installations for cranes not covered in this section, see order 1358.

2. Outline Lighting and Signs. Switch installations for outline lighting and signs shall conform to the requirements of orders 1365-d and 1366-a, in addition.

3. Service Entrance Switches. For additional requirements see orders 1324 and 1325.

Order 1351. General Requirements for Fuses and Circuit Breakers.

(a) **Where Fuses and Circuit-Breakers are Required.**

(1) Fuses or circuit-breakers shall be placed at every point where a change is made in the size of the wire unless the fuse or circuit-breaker in the larger wire will protect the smaller one.

(2) Fuses shall be used to protect all wires of branch or tap circuits.

(3) Each conductor of motor circuits shall be protected by a fuse or circuit-breaker. Except on main switchboads or where otherwise subject to competent supervision, automatic overload circuit-breakers shall be protected with approved fuses.

Exception: (1) Direct current and single-phase alternating current motors may have one side protected by an automatic overload circuit-breaker only if the other side is protected by a fuse.

(2) Circuit-breakers only will be approved for the protection of motor circuits having a maximum capacity greater than that for which approved enclosed fuses are rated.

(3) If an A. C. starter when in running position opens all wires of the circuit automatically under overload it may also serve as a circuit-breaker.

(4) Small motors may be grouped under the protection of a single set of fuses, provided the rated capacity of the fuses does not exceed 10 amperes and the total wattage of the circuit does not exceed 660.

(5) Heaters of six amperes or 660 watts capacity or less, may be grouped under the protection of a single set of fuses, provided the rated capacity of the fuses does not exceed ten (10) amperes, or may be connected individually to lighting circuits when the normal load in use on the circuit at any time will not exceed 660 watts. Subdivision circuits of a heater need not be separately fused.

(b) **Type of Fuses Required.** Except in stations and substations (see part 1), only fuses of the enclosed type (plug or cartridge) may be used.

(c) **Tampering with Fuses.** Nothing shall be done to fuses, either temporarily or permanently, which will defeat the purpose for which they are installed, or which will increase the capacity above the rating of the fuse.

(d) **Guarding Live Parts of Fuses.**

(1) All fuses shall be so arranged that they may be disconnected from all sources of electrical energy, by properly placed switches, before being handled.

(2) All fuses shall be installed in locked cabinets or otherwise made inaccessible to other than qualified persons while the fuses are alive.

Exception: Fuses in rooms inaccessible to other than qualified operators (including penthouses containing elevator control panels) are exempted from this order.

(e) **Arcing or Suddenly Moving Parts.** Fuses and circuit-breakers shall be so located and shielded that persons will not be burned or injured by their operation.

(f) **Interlocking Circuit-Breakers.**

(1) Automatic overload circuit-breakers shall have the overload trip coils arranged so that the operation of any one pole will open all of the conductors simultaneously.

(2) In two or three-phase three-wire circuits and two-phase four-wire circuits there shall be an overload trip-coil in each of two phases and in four-wire three-phase circuits there shall be a trip-coil in each phase.

(3) If a circuit breaker is used in place of a switch as permitted by order 1350-a, exception 2, it shall be so arranged that no one pole can be opened manually without disconnecting all the wires.

Exception: The above order does not apply to grounded return circuits of electric railway systems.

(g) **Fuses and Circuit-Breakers in Neutral Wires, Ground Wires and Fixture Canopies.**

(1) Permanently grounded conductors including service wires, shall be arranged without fuses and circuit-breakers interrupting their continuity, unless the device used opens all conductors of the circuit with one operation.

Exception: Branch or Tap Circuits.

(2) Automatic cut-outs shall not be placed in fixture canopies.

Order 1352. Capacity of Fuses and Circuit Breakers.

(a) **Determining Size of Fuses and Circuit-Breakers.** The rated capacity of fuses shall not exceed the allowable carrying capacity of the wires they protect as given in table III of order 1341-a. Circuit-breakers shall not be set more than 30 per cent above allowable carrying capacity of the wires protected.

(b) **Fuses for Branch Circuits.**

(1) Branch circuits supplying incandescent lamps with candelabra bases shall not have more than 500 watts connected load, and shall be protected by fuses not larger than 6 amperes rated capacity.

(2) Branch circuits supplying small motors, small heating devices, or incandescent lamps with larger than candelabra bases shall not have more than 1000 watts connected load, and shall be protected by fuses not larger than 15 amperes rated capacity.

Exception: In cases where wiring equal in size and insulation to No. 12 A. W. G. rubber-covered wire is carried directly into keyless medium screw base sockets or receptacles of stage borders, footlights, proscenium side lights, signs and outline lighting, the connected load may be increased to 2000 watts and the size of fuse to 20 amperes rated capacity. (See also Exception to (5) below.)

(3) Branch circuits supplying only vapor lamps (See Order 1362) or incandescent lamps with mogul bases shall not have more than 4000 watts connected load, and shall be wired with not less than No. 8 A. W. G. wire in the circuit and not less than No. 12 A. W. G. wire in the taps from circuit wires and shall be protected by fuses not larger than 35 amperes rated capacity.

(4) Residences, apartments, offices, stores and public buildings, shall be so wired as to provide the equivalent of one circuit for every 1000 sq. ft. of floor area (the floor area to include space occupied by walls and partitions).

Exceptions: Attics, porches, basements and public halls of these buildings, are exempt from this requirement.

(5) Buildings, except those listed in (4) above, shall be so wired that no branch circuit supplies more than 25 candelabra, 16 medium or 8 mogul size sockets or lamp receptacles.

Exception: Under the conditions cited in the exception to (2) above, 32 medium base sockets or receptacles may be wired on one branch circuit.

(c) **Fused Rosettes.** Fused rosettes shall not be used.

Order 1353. Cut-out Boxes and Cabinets.

(a) **Material.** Cut-out boxes, switch cases, cabinets or other inclosures shall be of metal, except that wood may be used for car-houses.

(b) **Wiring Spaces of Metal Cabinets.**

Cabinets and cut-out boxes, when used to inclose devices or apparatus connected within the cabinet or cut-out boxes to the wires of more than four power circuits or more than eight lighting circuits, not including the supply circuit or a continuation thereof, shall have back wiring spaces or one or more side wiring spaces, side butters or wiring compartments, unless the wires leave the cabinet or cut-outbox directly opposite their terminal connections..

(c) **Inside Dimensions of Metal Cabinets.**

(1) The spacing within cabinets and cut-out boxes shall be sufficient to provide ample room for the distribution of wires and cables placed in them, and for a separation between metal parts of cabinets or cut-out boxes and current-carrying parts of devices and apparatus mounted within them as follows:

(2) There shall be an air space of at least 1-16 inch, except at points of supports, between the base of the device and the wall of any metal cabinet or cut-out box on which the device is mounted.

(3) There shall be an air space of at lease one inch between any live metal (including enclosed fuses) part and the door unless the door is lined with an approved insulating material when the air space shall be not less than one-half inch.

(4) There shall be an air space of at least one-half inch between the walls, back, gutter partition, if of metal, of any cabinet or cut-out box and the nearest exposed current-carrying part of device mounted within the cabinet where potentials do not exceed 300 volts. This spacing shall be increased to at least one inch where the potentials exceed 300 volts.

(5) Cabinets having one or more side wiring spaces, side gutters or side wiring compartments shall be furnished with covers, barriers or partitions extending around or from the side or sides of all bases or groups of bases of the switches, cut-outs, circuit breakers, or feeders and circuit banch panel boards within the cabinet and providing a close fit with the door, frame or sides of the cabinet so as to enclose these spaces, gutters or compartments and the wires stowed within them. At sides where wires or cables are fed from the cabinet at points directly opposite their terminal connections to devices or apparatus within the cabinet, and other wires or cables are not placed, these covers, barriers or partitions may be omitted.

(6) When cabinets have back wiring spaces which are not entirely enclosed, covers shall be furnished to provide equivalent enclosure.

(d) **Unsued Openings in Cabinets.** All unused outlet openings in cabinets and cut-out boxes, shall be effectively closed by metal which will afford protection substantially equivalent to that of the walls of the cabinet or cut-out box.

(e) **Cabinets of Wood.**

(1) Cabinets made of wood or composition material as permitted by order 1345-h whether for flush or surface mounting shall be rigid and substantial. Doors shall fit closely. The detailed specifications for sheet metal cabinets shall be followed so far as they apply.

(2) Wood, when used for the construction of cabinets shall be well-seasoned, at least three-fourths inch in thickness, and shall be thoroughly filled and painted. Cabinets made of wood shall be completely lined with a non-combustible material firmly secured in place. Linings of slate, marble or approved composition shall be at least one-quarter inch in thickness. Sheet metal, if used as lining, shall be at least No. 16 U. S. sheet metal gage. One-eighth inch rigid asbestos board may be used for linings when firmly secured in place.

Order 1354. Switchboards and Panelboards.

(a) **Switchboards.**

1. Switchboards if accessible only to qualified persons shall be installed as required by orders 1120-e and 1142 of part 1.

2. If installed where accessible to other than qualified persons, as in work-rooms of mills and factories, mercantile establishments, hotels and other public buildings, they shall in addition be guarded as required by order 1310, and insulating floors, mats or platforms provided as required by order 1120-e-2, section 112 of part 1.

(b) **Panelbards.** Panelboards for lighting distribution cabinets shall be so constructed that persons while operating the switches are at all times protected against accidental contact with live metal parts.

Order 1355. Controllers.

(a) **Accessible and Indicating.**

The requirements for accessibility and the indication of the function of controllers, starting rheostats and auto-starters shall conform to orders 1350-b and c for switches.

(b) **Contacts.** Controllers and rheostats shall be so constructed as to make and maintain good contact.

(c) **Resistors.**

(1) Resistors shall be placed on switchboards, or at a distance of at least one foot from combustible materials, or separated therefrom by slabs or panels of non-combustible, non-absorptive, insulating material such as slate, soapstone, or marble, somewhat larger than the resisters and secured in position independently of the supports of such resisters.

(2) Bolts for supporting the resistors shall be countersunk at least ⅛ inch below the surface at the back of the slab and the bolt heads shall be covered with insulating material or there shall be an air space of at least one inch between the back of the slab and the surface protected.

(3) For proper mechanical strength the slab used should be made of a thickness consistent with the size and weight of the resistor.

Order 1356. Transformers.

(a) **Location.**

(1) Transformers shall not be attached to the wall of any building when the voltage exceeds 750.

(2) Oil transformers shall not be placed on or inside of any building, except electrical test rooms, generating stations and substations, unless inclosed in a transformer vault.

(3) Air cooled transformers shall not be placed inside of any building, excepting generating stations or substations, if the highest voltage of either primary or secondary exceeds 750 volts, unless inclosed in a transformer vault.

(4) Air cooled transformers of less than 750 volts, with the exception of bell ringing and other signalling transformers, shall be so mounted that the case is a distance of at least one foot from combustible material or separated therefrom by non-combustible, non-absorptive insulating material, such as slate, marble or soapstone. This will require the use of a slab or panel somewhat larger than the transformer.

Exception: This requirement does not apply to apparatus or fittings, the operation of which depends either wholly or in part upon special transformers embodied in the devices, but all such apparatus or fittings shall comply to these rules in all other respects.

(b) **Auto-Transformers.** Transformers in which a part of the terms are common to both primary and secondary circuits shall not be used inside buildings to supply lighting circuits if the highest voltage involved exceeds [illegible] volts.

Order 1357. Motors and Generators.

(a) **Bushes and Bases.**

(1) Bushings for lead wires coming through the frames of motors and generators shall be of non-absorptive insulating material.

Exception: Soft rubber may be used if not exposed to oils, grease or other delecterious substances in such quantities as to cause its rapid destruction.

(2) When terminal bases are used, they shall be of approved non-combustible, non-absorptive, insulating material such as slate, marble or porcelain.

(b) **Dripping.**

(1) Where there is likely to be oil dripping from motors and generators suitable drip pans shall be provided.

(2) Suitable guards or inclosures shall be provided to protect exposed current-carrying parts and the insulation of leads of motors and generators from dripping oil, excessive moisture, steam, vapors, chemicals or similar injurious substances.

(c) **Speed-Limiting Devices.** Machines of the following type shall be provided with speed-limiting devices unless the load and the mechanical connection thereto are of such a character as to safely limit the speed or unless the machine is always under the manual control of a qualified operator.

(1) Separately excited direct-current motors.

(2) Series motors.

(3) Motor-generators and converters which can be driven at excessive speed from the direct current end, as by the reversal of current or decrease in load.

(d) **Weak Field.** Where the speed adjustment of direct current motors is accomplished by varying the field resistence, and the nature of the load and the range of the field-rheostat are such as to make a dangerous speed attainable and no speed-limit devices are used, the field-rheostats shall be arranged with low-voltage releases or other necessary devices so that the motor can not be started or continued in operation under dangerously weakened field except where the operation of such a low-voltage release might result in serious injury to service or apparatus.

Exception: Motors which are designed to permit operating under weakened field are not included in the above.

(e) **Wiring.** Where speed-limiting devices or remote-control switches are electrically operated, the control circuits by which such devices are actuated shall be adequately guarded by conduit or otherwise, against mechanical injury.

(f) **Under or Low-Voltage Protection.** Where the restarting of the motor on restoration of voltage may result in injury to persons or apparatus under or low-voltage protection, which will cause and maintain the interruption of power to the main circuit, upon reduction or failure of voltage, shall be supplied.

Exception: When the motor and driven machinery are isolated and accessible to qualified persons only, the provision of a disconnecting switch eliminates the hazard to persons.

(g) **Reverse-Phase Relays for Motors.** Electric freight or passenger elevators or cranes, operated by polyphase alternating-current motors, shall be provided with relays of the potential type which will prevent starting the motor if the phase rotation is in the wrong direction.

(h) **Operation.** Only motors especially designed for the purpose may be run in series—multiple or multiple-series.

(i) **High Potential Systems.**

(1) Motors or generators shall not operate at voltages in excess of 2500, except in rooms or enclosures accessible only to qualified electrical operators.

(2) Motors operating at voltages above 750 volts shall be wired with approved multiple conductor, metal sheathed cable in rigid metal conduits, or other suitable ducts.

Exception: Where not exposed to moisture, the sheathing may be omitted

(3) When sheathing is required the ends of the sheaths shall be belled-out and bonded around splices by No. 6 A. W. G. wire and ground clamps.

(4) The insulation of the several conductors where leaving the metal sheath of cables, shall be protected from moisture, and mechanical injury by pot-heads or equivalent methods.

Order 1358. Cranes.

(a) **Special Requirements.** In addition to complying with the other orders of this code that apply, all wiring and electrical equipment of cranes shall comply with the following requirements:

(b) Wiring.

(1) All wires except bare collector wires, those between resistances and contact plates of rheostats and those subjected to severe external heat, shall be rubber-covered and not smaller in size than No. 12 A. W. G.

(2) Insulation on wires between resistances and contact plates of rheostats shall conform to order 1358-e.

(3) Wires subjected to severe external heat shall have slow-burning insulation.

(4) All wires excepting bare wires, shall be run in conduit, armored cable, or shall be supported by knobs or cleats which separate them at least one inch from the surface wired over.

Exception: In dry places where space is limited and the distances between wires, as required by order 1343-d-1 and h-1, cannot be obtained, each wire shall be separately encased in flexible tubing securely fastened in place.

(5) Trolley conductors carried along crane runways shall be rigidly and securely attached to their insulating supports at least every 20 feet and held at ends by strain insulators. If wires are run in a horizontal plane, they shall be separated at least 6 inches; if not run in a horizontal plane they shall be separated at least 8 inches; if spans are longer than 20 feet, the distance between wires shall be increased proportionately, but in no case shall spans exceed 30 feet.

Exception: Clamp car hangers will be considered the equivalent of rigid supports.

(6) Trolley conductors shall be located in such a position or so guarded that persons working on the crane or persons entering or leaving crane cab, are not likely to make accidental contact with live parts.

(7) Bridge collector wires shall be held at ends by strain insulators and when spans of cranes exceed 50 feet, insulated supports, on which the wires may loosely lie, shall be provided every 30 feet.

(8) Bridge collector wires shall be kept at least 2½ inches apart and separated at all times at least 1½ inches from the surface wired over.

(9) Bridge collector wires shall not be smaller in size than specified in the following table for the various spans:

Length of Span—Feet	Size Wire Required—A. W. G.
0 to 30	6
31 to 60	4
Over 60	2

(10) Bridge collector wires shall be so arranged or so guarded that hoisting cables cannot be brought into accidental contact with them.

(11) Monorail runway conductors on I-Beam or equivalent structural runways shall have a minimum horizontal spacing of 2½ inches between conductors and a minimum clearance of 1½ inches from grounded metal parts, if a wire is used for the conductors, or 1 inch if steel bars or shapes are used.

(c) Switches, Fuses and Circuit-Breakers.

(1) Runway trolley wires for traveling cranes or the feeder wires for other types of cranes shall be protected by fuses or circuit-breakers and controlled by a switch which can be locked in the open position. Fuses or circuit-breakers and switches shall comply with orders 1350-h and 1351-d shall be so located as to be easily accessible from the floor.

(2) All electric cranes shall be equipped with a main line switch connected into the leads from the crane runway wires, and so located in the cab as to be readily accessible to the operator. This switch shall comply with order 1350-h and shall have means for locking in the open position.

Exception: Where cabs are attached to the crane trolley an additional main line switch of the same type shall be provided as near as possible to the main collectors.

(3) With cranes or cab controlled monorail hoists having more than one motor, each motor shall be protected by fuses, a circuit breaker or overload relays controlling line contactors. If fuses are used, one fuse shall be provided in each conductor. If circuit-breakers or overload relays are used, the number of trip coils shall not be less than required by order 1351-f-2.

Exception: Jib cranes, pillar cranes, and floor controlled hoists having a combined motor horse power of 10 or less need not have individual motor protection.

(4) Each hoisting motor shall be equipped with a limit switch so placed and so arranged as to disconnect the motor, apply the brake and stop the hook before the hook passes the highest point of safe travel.

Buffers at Travel Limit and Between Cranes.

(1) The bridge and trolley shall be provided with substantial and effective buffers, preferably of the air-cushion, spring or similar type; or the end of rail with a radius larger than the wheel shall be employed.

(2) Where two or more cranes are operating on the same runway, substantial and effective buffers of the air-cushion, spring or similar type, shall be provided.

(c) Brakes.

(1) Each hoist motor shall be provided with a "magnetic brake" so arranged that the brake will be applied when the power is cut off from the brake motor. This brake shall have sufficient torque to sustain at least one and one-half times the full rated load.

(2) Cranes which have a cab on the trolley shall be provided with a brake for the trolley motion.

(3) The bridge travel shall be provided with a brake.

(4) The brakes specified in (2) and (3) above shall be capable of producing a torque sufficient to retard at the rate of not less than one foot per second. When manually operated, this rate of retardation shall not require a force on the brake lever in excess of one hundred pounds.

(d) Grounding. The metallic parts of portable cranes, derricks, hoists, and similar equipment on which wires, cables, chains or other conducting objects are maintained shall be provided with an effective protective ground if operated in the vicinity of electric wiring or equipment over 100 volts to ground, whether the cranes or similar equipment are themselves electrically operated or not.

(e) Controllers.

(1) Controllers shall be installed as required by order 1355.

Exception: If the crane is located out doors the insulation on wires between resistors and contact plates of rheostats shall be rubber where the wires are exposed to moisture and insulation is necessary and also where wires are grounded.

(2) If the crane operates over readily combustible material, the resisters shall be placed in an inclosure made of non-combustible material, thoroughly ventilated and so constructed that it will not permit any flame or molten metal to escape in the event of burning out of the resistors. If the resistors are located in the cage, this result may be obtained by constructing the cage of noncombustible material and providing sides which inclose the cage from the floor to a height of at least 6 inches above the top of the resistors.

(3) If each controller is not arranged to return automatically to the "off" position when the operating handle is released, each crane shall be provided with a device which will disconnect all motors from the line on failure of power and will not permit any motor to be restarted until the controller handle is brought to the central position or a recess switch or button is operated.

(4) Manual controllers or the manually operated part of remote controllers shall be provided with a device that will definitely indicate to the operator by sense of feeling when the controller is in the "off" position.

(5) All controller handles shall, as far as practicable, be so arranged that their movement is in the same general direction as the resultant movement of the load controlled, and so that the operator can readily face the direction [illegible]

SECTION 136. LIGHTING FIXTURES AND APPLIANCES, INCLUDING SIGNS AND OUTLINE LIGHTING.

Order 1360. Fixtures.

(a) Wires.

(1) Fixtures when wired on outside shall have the wires so secured as to prevent cutting or abrasion by the pressure of the fastenings or motion of the fixture.

(2) Chain fixtures shall be wired with flexible conductors.

(3) At fixtures, the circuit wires, especially the splices to fixture wire shall be kept clear of the grounded part of gas pipes, and where canopies or outlet boxes are used, they shall be made sufficiently large to allow the fulfillment of this requirement.

(4) Indoor fixtures shall have rubber-insulated wires, except that where wires are subjected at any point to a temperature exceeding 49 degrees C. (120 degrees F.) as in showcase or ceiling types, they shall be provided with wires having slow-burning or other heat-resisting coverings.

Outdoor fixtures shall have rubber-insulated wires.

Wires shall be without joints or splices in fixture stems.

Supports.

Fixtures shall be suitably supported.

Fixtures having so-called flat canopies, tops or backs shall not be used except where sufficiently deep outlet boxes are used.

Insulating Joints and Canopy Insulators.

Where noncurrent-carrying metal parts of fixtures are not grounded, [illegible] Exception (1) of order 1313-c, section 131, fixtures shall be insulated [illegible] and adjacent grounded surfaces, by means of insulating [illegible] insulators.

Exceptions: [illegible] Canopy insulators will not be required where ceilings [illegible] metal where plaster is not secured by metal lathing and [illegible] make contact with outlet boxes.

[illegible] and canopy insulators will not be required for [illegible] connected to knob and tube or open wiring of plaster [illegible] construction.

[illegible] when used shall be placed as close to ceiling or wall [illegible]

[illegible] when used shall be continuous and in one piece [illegible] fastened in place so as to separate the canopies thoroughly [illegible] from the surface and outlet box or plate from which they [illegible] insulated.

Insulation

[illegible] shall be so designed and installed that no current-[illegible] will be exposed externally.

[illegible] free from short-circuits between wires and from con[illegible] metal parts of fixtures, and shall [illegible] before being connected to supply wires.

[illegible] wires of branch circuits shall be connected to screw [illegible] danger of shock in case this part makes con[illegible] of fixture, or becomes exposed.

Outdoor Fixtures. Fixtures shall be of weatherproof construction, [illegible] the outside.

Limitation.

[illegible] current systems shall never be contained in or attached to [illegible] and under no circumstances may any conductors contained [illegible] fixture operate at a potential higher than 300 volts to [illegible]

[illegible] gas lighting unless it is the frictional system, shall not be [illegible] with the electric light.

[illegible] lamps in series circuits shall not under any circum[illegible] attached to gas fixtures.

Order [illegible] Fixtures for Gas-filled Incandescent Lamps.

Wiring of Fixtures.

[illegible] for gas-filled incandescent lamps within buildings shall have [illegible] slow-burning or other heat-resisting coverings where the [illegible] which the wire is subjected at any point exceeds 120 degrees F.

Sockets.

[illegible] incandescent lamps shall not be used in connection with [illegible] sockets or receptacles if of above 200 watts nominal capacity nor [illegible] sockets or receptacles if of above 1,500 watts nominal ca[illegible]

[illegible] above 100 watts in size, such lamps shall not, if provided with [illegible] fixture or other enclosure above the socket, be used in either [illegible] types of sockets or receptacles having fiber or paper [illegible]

Gas-filled Lamps in Show Windows. Gas-filled incandescent lamps shall [illegible] in show windows or in other locations where inflammable material [illegible] to come in contact with lamps, shades or reflectors, unless [illegible] fixtures equipped with shades or guards suitably ventilated to prevent [illegible] rise of temperature.

Order 1362. Vapor Lamps.

(a) Mercury Vapor Lamps. Resistors of mercury-vapor lamps shall be inclosed in noncombustible cases and shall be treated as sources of heat. In locations where these resistors or regulators are subject to flyings of lint or combustible material, all openings through cases shall be protected by fine wire gauze.

(b) High-Potential Tubes.

(1) The tube shall be so installed as to be protected from mechanical injury or liability to contact with inflammable material.

(2) High-potential coils and regulating apparatus shall be installed in approved steel cabinets not less than 1-10 inch in thickness, ventilated in such a manner as to prevent the escape of any flame or sparks, in case of burnout in the various coils. All apparatus in this box shall be mounted on a slate base and the enclosing case grounded as specified in order 1313-c. Supply wires leading into this high-potential case shall be installed in accordance with section 134.

Order 1363. Arc Lamps and Constant-Current Series Lamps.

(a) Disconnecting Device. A suitable device shall be provided by which each arc lamp or other device on series circuits may be safely and entirely disconnected from the circuit before it is handled, unless the lamps are accessible only to properly qualified persons, worked on only from suitably insulated stools, platforms or tower wagons and treated always as under full voltage of the circuit concerned.

(b) Wires.

(1) Lamps when arranged to be raised and lowered, either for carboning or other purposes, shall be connected with stranded conductors from the last point of support to the lamp, when such conductor is larger than No. 14 A. W. G.

(2) These branch conductors shall have a carrying capacity at least fifty per cent in excess of the normal current required by the lamp.

(3) Interior wiring for arc lamps shall have an approved rubber insulating covering. Wires shall always be in plain sight, and never incased.

(4) Wires for arc and constant-current series lamps shall be supported on glass or porcelain insulators, which separate the wires at least one inch from the surface wired over and shall be kept rigidly at least eight inches from each other, except on hanger-boards or in cut-out boxes or like places, where a less distance is necessary.

(5) Incandescent lamps in series circuits shall have the wires installed as required above and each lamp shall be provided with an automatic cut-out.

(c) Resistors and Regulators.

(1) Resistors or regulators of arc lamps and constant-potential circuits shall be inclosed by noncombustible material, and shall be treated as sources of heat. Incandescent lamps shall not be used as resistors.

(2) Economy and compensator coils for arc lamps shall be mounted on noncombustible, nonabsorptive, insulating supports, such as glass or porcelain, allowing an air space of at least one inch between frame and support, and shall in general be treated as sources of heat.

(d) Guarding.

(1) Arc lamps shall be supplied with globes and wire netting around the globes (having a mesh not to exceed 1¼ inches) and shall be protected by spark arresters. Broken or cracked globes shall not be used.

(2) Lamps shall be placed out of reach or otherwise suitably protected.

(3) Lamps shall be secured from falling on persons or traffic passing below, and the hanger rope, chain or other means adopted for holding the lamps shall be regularly and systematically inspected.

(e) Supports. All metal cable or chain supports for constant-current series lamps shall be effectively insulated from the lamp and shall also be insulated at a point not less than 8 feet from the ground.

Order 1364. Decorative Lighting.

For temporary installations of approved systems of decorative lighting, the difference of potential between the wires of any circuit shall not be over 150 volts, and not more than 1320 watts shall be dependent on one cut-out.

Order 1365. Outline Lighting. (Exterior.)

(a) Wiring.

(1) For outline lighting, open wiring, conduit or metal-trough construction may be used but raceways shall not be used.

(2) Wires for use in rigid or flexible steel conduit shall comply with requirements for conduit work.

(3) Where armored cable is used, the cable shall be protected from moisture by lead sheath between armor and insulation.

(4) For open work, wires shall be rubber-covered, not less than No. 14 A. W. G. and shall be rigidly supported, on noncombustible, nonabsorptive insulators not over 4½ feet apart, which separates the wires at least one inch from the surface wired over. If the wires are liable to be disturbed, the distance between supports shall be shortened.

(5) In those parts of circuits where wires are connected to receptacles which hold them at least one inch from the surface wired over, and which are placed not over one foot apart, such receptacles will be considered to afford the necessary support and spacing of the wires.

(6) Between receptacles more than one foot, but not more than two feet apart, an additional noncombustible, nonabsorptive insulator maintaining a separation and spacing equivalent to those of the receptacles shall be used.

(7) Except as above specified, wires shall be kept apart at least 2½ inches for voltages up to 300 and four inches for higher voltages.

(8) Metal-troughs shall be weatherproof, and other details shall comply with such requirements of orders 1340-1346, inclusive, as apply, and 1375.

(b) Sockets and Receptacles.

(1) Sockets and receptacles shall be of the keyless weatherproof type and wire connections shall be soldered.

(2) Miniature base devices shall not be used.

(c) Cabinets.

(1) Cut-outs, switches, flashers, transformers, and similar appliances shall be of proper types and shall be installed as required for such appliances.

(d) Switches. Outline lighting shall be protected by switches which disconnect all conductors.

Order 1366. Signs.

(a) Switches. Electric signs, located as noted in (c) below shall be provided with switches, which disconnect all feed wires of the sign, and which shall be either located within sight of the sign or arranged so that they can be locked in the open position.

(b) Connectors.

(1) Electric signs with changeable connections shall be so arranged that the changeable connections can be changed manually only by connectors in which all poles of the circuit are simultaneously interrupted.

(2) All current-carrying parts of pin-and-socket connectors shall be provided with guards, so as not to be exposed to contact.

(c) Accessibility and Guarding.

(1) Electric signs, any part of which are at an elevation greater than 80 feet above the ground, or at an elevation above a roof greater than the distance from the edge of the roof, shall be provided with substantial safely accessible runways, ladders or platforms from which all replacements and other necessary adjustments can be made. Provision for supporting workmen by safety belts shall be made in the construction and maintenance of signs so located.

(2) Electric signs outside buildings shall have no current-carrying parts normally exposed to contact.

(3) The exposed noncurrent-carrying metal parts of a sign shall be grounded if within reach of any grounded surfaces including metal work of the building structure.

Order 1367. Heating Devices.

(a) Flexible Cord.

(1) Flexible cords for smoothing and pressing irons, and for all heating devices requiring over 250 watts shall be of the packing house type in damp places, and of the electric heater type (rubber and asbestor covered) in dry places.

(b) Guarding. Stationary heaters, such as radiators, ranges, plate-warmers, etc., shall be so located as to furnish ample protection between the device and surrounding combustible material.

(a) Inclosure Required. Electric furnaces and apparatus used for arc welding, where intensely glowing, incandescent, or arcing parts are exposed shall be inclosed, so that those parts will not be readily accessible or visible to unauthorized persons, and warning signs shall be displayed.

(b) Protective Hoods, Goggles, etc., Required. Suitable protecting screens, hoods, goggles, gloves, and other devices shall be provided for the authorized operators who must work or come near such exposed parts.

(c) Guarding. Except at points where necessarily left exposed (as at spot welder contacts) all current-carrying parts of furnace, welders, and control equipment shall be suitably guarded with inclosures or barrier guards.

SECTION 137. THEATERS, ASSEMBLY HALLS, MOTION-PICTURE ESTABLISHMENTS, INCLUDING PICTURE MACHINES.

Order 1370. Special Requirements. In addition to complying with the other orders of this code, all wiring and electrical equipment of theaters shall comply with the following special orders (1371-1379 inclusive):

Order 1371. Service.

(a) Independent Supply and Branch Lines for Emergency Lighting.

(1) Electrical emergency lights, including all supply and branch lines, shall be entirely independent of the other lights and electrical equipment of the theater.

(2) Where it is practicable to obtain energy from two separate street mains, two separate and distinct services shall be installed. One of these services shall be of sufficient capacity to supply current for the entire electrical equipment of the theater, including possible additional portable load, while the other service shall be at least of sufficient capacity to supply current for all emergency lights.

(3) Where it is not practicable to obtain energy from two separate street mains, the feed for emergency lights shall be taken from a point on the street side of the main service fuses.

(4) Where the source of energy is an isolated plant within the same building, an auxiliary service of sufficient capacity to supply all emergency lights from some outside source or a suitable storage battery within the premises shall be installed.

Order 1372. Fusing and Control of Exit Lamps. Emergency lights shall not have more than one set of fuses between them and their service fuses, shall be fed independently of the stage lighting, shall be controlled only from the lobby or other convenient place in the front of the house, and fuses and control shall be accessible only to authorized persons.

Order 1373. Dressing Room Lamps. All pendent lights shall be equipped with armored cable, or steel armored flexible cord, and shall be provided with guards which are sealed or locked in place.

Order 1374. Switchboards.

(a) Construction and Guarding.

(1) Stage switchboards shall be constructed as required by order 1142, section 114 of part 1, and in addition shall be of the "dead-front" type so that the operator is at all times protected against any possibility of contact with live metal parts.

(2) Stage switchboards shall have a metal hood over the top running the full length of the board and fully protecting same from anything falling from above.

(b) Dimmer Switches. Switches controlling circuits of which dimmers form a part, shall be arranged to disconnect the dimmer completely, except that on three-wire mains with grounded neutral, the neutral shall be run through to the dimmer without a switch in it.

(c) Dimmers to be Inclosed. Dimmers shall be placed in a well ventilated noncombustible inclosure, accessible only to qualified persons.

Order 1375. Stage Wiring.

(a) Plug Receptacles.

(1) Plug receptacles for arc and incandescent lamps shall be different, so that arc lamps cannot be connected onto an incandescent lamp receptacle and vice versa.

(2) Plug receptacles shall be controlled from switchboard only.

(3) Plug receptacles shall not be rated at less than 35 amperes for arc lamps, and 15 amperes for incandescent lamps.

(4) Plug receptacles shall be wired to full capacity, but in no case shall a wire smaller than No. 6 A. W. G. be used for arc lamps, nor smaller than No. 12 A. W. G. for incandescent lamps.

(b) Footlights, Borders and Proscenium Sidelights.

(1) Footlights, borders and proscenium sidelights shall be so wired that no set of lamps requiring more than 1320 watts, nor more than 32 receptacles, shall be dependent upon one cut-out. The lamp receptacles shall be inclosed in approved outlet boxes or mounted in approved footlight sections constructed of sheet iron or steel, of a thickness not less than No. 20 U. S. Sheet Metal gage, and treated to prevent oxidation.

(2) Cables for borders shall be of the stage cable type, and shall be suitably supported to prevent mechanical strain at connections and abrasion to cable. Conduit construction shall be used from switchboard to point where cables must be flexible to permit raising and lowering of border.

(3) For the wiring of footlights, borders and proscenium sidelights, wire with slow-burning insulation shall be used.

(4) Borders shall be suspended by wire rope and shall be insulated therefrom by at least one strain insulator inserted in each rope at the border.

(5) Borders and proscenium sidelights shall be provided with suitable guards to prevent scenery or other combustible material coming in contact with lamps.

(c) Strip and Bunch Lights.

(1) Strip and bunch lights shall have lamp receptacles inclosed in outlet boxes or mounted in inclosures of sheet iron or steel, of a thickness not less than No. 20 U. S. Sheet Metal gage, and treated to previous oxidation.

(2) The cables supplying strip and bunch lights shall be tubed in a suitable manner where passing through the metal and shall be secured to prevent excessive strains from coming on the wire connection and the connections to the lamp receptacles shall be soldered.

(d) Scene Docks. Where lamps are installed in scene docks, they shall be so located or guarded that they will not be liable to mechanical injury.

(e) String and Festoon Lights.

(1) String and festoon lights shall be made up of proper fittings for such use. Joints and splices in wires shall be soldered and tapped and staggered.

(2) Where lamps are used in lanterns or similar devices, effective guards shall be used.

(f) Special Electrical Effects.

(1) Bracket fixtures used for lights on scenery shall be securely fastened in position and have inclosed wiring. Fixture stems shall project three inches beyond the back of scenery and have terminal bushings.

(2) Where devices are used for producing special effects such as lightning, waterfalls, etc., the apparatus shall be so constructed and located that flames, sparks, etc., resulting from the operation cannot come in contact with combustible material.

Order 1376. Curtain Motors and Ventilating Flues.

(a) Curtain Motors. Curtain motors shall be of the inclosed type. (See also order 1357.)

(b) Ventilating Flues.

(1) Where dampers for ventilating flues are released by an electric device, the operating circuit shall be normally closed.

(2) The magnet operating damper shall be wound to take the full voltage of the circuit from which it is supplied without the use of a resistance device and must not heat more than normal for apparatus of similar construction. It shall be located in a loft above the scenery and shall be installed in a suitable iron box with tight self-closing door.

(3) Such dampers shall be controlled by at least two standard single poles switches mounted within iron boxes provided with self-closing doors without lock or latch, and located, one at the electrician's station and the other as designated.

Order 1377. Portable Equipment.

(a) Arc Lamps.

(1) Arc lamps for stage effects shall each be in charge of a competent operator, except that one operator may have charge of two lamps when they are not more than ten feet apart, and are so located that he can properly watch and care for both lamps.

(2) Arc lamps shall be constructed of substantial materials capable of withstanding hard usage, shall be properly ventilated but in a manner to prevent sparks from being emitted and shall be constructed so that neither carbons nor live parts will be brought into contact with the metal casing during operation.

(b) Portable Plugging Boxes and Connectors.

(1) Portable plugging boxes shall be constructed so that no current-carrying part will be exposed, and each receptacle shall be protected by fuses mounted on slats or marble bases and enclosed in a fire-proof cabinet equipped with self-closing doors. The busbars of portable plugging boxes shall have a carrying capacity equivalent to that required for the total number of receptacles, each receptacle to be rated at not less than thirty amperes. The master cable supplying portable plugging boxes shall be provided with approved terminal plugs.

(2) Pin plug connectors shall be so installed that the female part of plug will be on live end of cable, and shall be so constructed that tension on the cable will not cause serious mechanical strain on the connections.

(c) Flexible Cords. Flexible cords used from receptacles to arc lamps, bunches and other portable equipment shall be stage cable, except that for the purpose of feeding a stand lamp, under conditions where cords are not liable to severe mechanical injury, a reinforced cord may be used, provided the protecting cut-out is fused for not over 10 amperes.

Order 1378. Picture Machine Equipment and Booths—Theater Type.

(a) Compliance with Other Orders.

(b) Lamps.

(1) Arc lamps shall be constructed entirely of metal of a thickness not less than No. 24 U. S. Sheet Metal gage, except where use of insulating material is necessary, and shall be constructed in such a manner as to provide safeguards against fire or accident.

(2) Incandescent lamps shall be inclosed in such manner as to attain the same ends.

(c) Wiring. All wiring in the booth shall have slow burning insulation.

(d) Switches. Each lamp of a machine shall have a separate switch located in the booth.

(e) Equipment. Generators, rectifiers and other equipment for transforming electric current shall not be placed within the booth.

Exception: If the booth is not less than 10 feet wide, by 19 feet long, by 8 feet high, and all such equipment is inclosed in fireproof material or thirty mesh wire screen, this requirement will be waived.

(f) Cabinets for House Lights. Cabinets containing control switches for auditorium lights shall not be located in the booth.

(g) Rheostats. Rheostats, transforming devices or any substitutes therefor shall be of types expressly for the purpose.

Order 1379. Picture Machine Equipments—Miniature Portable Type.

(a) General. All equipments including all attachments, current-controlling devices, motors if any, and other parts employed shall be constructed so as to minimize the hazards of operation, and to safeguard against fire or accident.

(b) Rating. The entire equipment shall consume not more than 660 watts.

(c) Lamps. Lamps shall be constructed in such a manner as to provide safeguards against fire or accident.

(d) Control Apparatus. Rheostats, transformers, switches and other similar current-controlling devices shall be attached to and form a part of the machine and shall have no live parts exposed.

SECTION 138. PUBLIC GARAGES

Order 1380. Special Requirements. In addition to complying with the other orders of this code that apply, all wiring and electrical equipment of public garages shall comply with the following orders (1381-1383 inclusive).

Order 1381. Wiring.

(a) Wall Outlets.

Conduits, armored cable (see order 1332-b) or metal raceways (see order 1333-a) shall be so installed that no outlet, junction box, wall receptacle, etc., will be located less than four feet from the floor.

(b) Floor Outlets. Floor outlets shall not be used.

Order 1382. Portables.

(a) Flexible Cord.

(1) Flexible cords for portable lamps, motors and other apparatus, except for charging, shall be cord designated for rough usage, preferably packinghouse cord or stage cable.

(2) Flexible cable for charging shall be stage cable, and shall have a current-carrying capacity of at least 50 amperes.

(3) Flexible cords for pendant lamps shall be of the reinforced type.

(b) Connectors.

(1) All portable cords shall have connected into them a pin or plug connector or equivalent device, so that the connector will break apart readily at any position of the cable.

(2) Current-carrying parts of connectors shall be guarded to prevent accidental contact.

(3) The fixed or wall connector, if not located on a switchboard or charging panel, shall be protected against accidental contact.

(c) Lamps. All portable lights shall be equipped with keyless sockets, of moulded composition or metal-sheathed porcelain type, equipped with a substantial guard having a heavy handle and hook.

Order 1383. Location of Equipment.

(a) Switchboard and Charging Panels. Switchboards and charging panels, at or upon which are mounted devices which in operation may cause sparking, shall be located in separate room or inclosure, provided for this purpose only, unless all such sparking or arching parts are at least four feet above the floor or surrounded by explosion-proof inclosure.

(b) Motors or Generators. Motors or generators not actually a part of a vehicle, if not located at least four feet above the floor, shall be of the explosion-proof type.

SECTION 139. SIGNAL EQUIPMENT CONNECTED TO SIGNAL LINES AND RADIO SIGNALLING APPARATUS.

Order 1390. Scope of Orders.

Orders 1391 and 1392 govern wiring and other protective arrangements for telephone, telegraph (except radio signalling apparatus) district messenger and call-bell circuits, fire and burglar alarms, and all similar systems which are hazardous only because of their liability to become crossed with or subjected to induce voltages from electric light, heat or power circuits, or because of exposure to lightning.

Orders 1393-1399 inclusive govern radio signalling apparatus and wiring.

Order 1391. Requirements for Wires and Cables supported on and Entering Buildings, Protectors, and Interior Wiring of Signal Equipment.

(a) Signal Wires on the Outside Walls of Buildings. Signal wires on the exterior of buildings shall not come nearer than four inches to supply wires, except when in conduit, unless separated therefrom by a continuous and firmly fixed nonconductor to maintain permanent separation. This nonconductor shall be in addition to the insulation of the wires.

(b) Insulating Joint in Aerial Cables. Where metal sheathed aerial cables, which are liable to contact with electric light or power wires, enter a building the sheath shall be interrupted by means of an insulating joint or by equivalent means placed immediately outside the building.

(c) Insulation of Drop Wires. The wires from the last outside support to the entrance to building and wires attached to the outside walls of buildings shall have a rubber insulation not less than 1-32 of an inch in thickness and shall be covered by a substantial braid; on frame buildings or frame portions of other buildings wires shall be inclosed in conduit or suppored on glass or porcelain insulators, or knobs.

(d) Entrance Bushings and Drip Loops. Wires shall enter building either through noncombustible, nonabsorptive insulating bushings or through rigid conduit. Bushings shall be installed in a manner to prevent entrance of moisture to the building. Conduit shall be so placed as to prevent the entrance of moisture, and fitted with an approved bushing or service head.

(e) Protector Required. Location. Signal wires shall be provided with an effective protective device located as near as practicable to the entrance of wires to building and in a readily accessible place. The protector shall not be placed in the immediate vicinity of inflammable materials, or where exposed to inflammable gases, dust or flyings.

(f) Wires from Entrance to Buildings to Protectors shall be inclosed in conduit or supported on porcelain insulators of a type and so spaced that the wires will not make contact with other objects or the surface wired over.

Exception: When wires are carried in cables, orders 1391. (C), (d) and (f) do not apply. The cable may be of the metal sheath type with conductors insulated with paper or other suitable material, or it may be of non-metallic sheath type in which case the insulation on the individual conductors shall conform to order 1391-c, except that the braid on individual conductors may be omitted.

(g) Protector Ground Wire.

The ground wire of the protective device shall be run in accordance with the following requirements:

1. It shall be of copper and not smaller than No. 18 A. W. G.

2. Where exposed to mechanical injury it shall be guarded, and on poles or where a ground wire on the outside of building wall is near a roadway, sidewalk or pathway, it shall be protected for a distance of 8 feet from the ground by a wooden moulding or by conduit, which if of magnetic material shall be electrically connected at both ends to the ground wire.

3. It shall have a rubber insulation of not less than 1-32 of an inch in thickness which shall be covered by a substantial braid.

4. It shall be run in as straight and short a line as practicable to a permanent and effective ground.

(h) Protector Ground Connection.

1. The permanent and effective ground called for in (g) above shall be obtained by connecting to extensive underground water or gas pipe systems, to a ground rod or pipe driven into permanently damp earth, or to a metallic plate or other body buried in permanently damp earth.

2. Connection shall always be made to water pipes where practicable.

3. If attachment is made to gas pipe, the connection in all cases shall be made between the meter and the street mains.

4. When the ground wire is attached to a water pipe or a gas pipe it shall be connected by means of an effective ground clamp fastened to a thoroughly cleaned portion of the pipe, or the pipe shall be thoroughly cleaned and tinned with rosin flux solder, and the ground wire wrapped tightly around the pipe and thoroughly soldered to it.

5. When the ground wire is attached to a ground rod driven into the earth, the ground wire shall be soldered to the rod in a similar manner as specified in (4) above.

6. In all cases the ground wire shall be so attached to the rod or pipe as to give a reliable connection both mechanically and electrically, and in such manner as to prevent corrosion when the joint is buried in the earth.

7. Where buried plate or other metal electrode is employed, the ground wire shall be securely fastened to it in such manner as to make a reliable electrical and mechanical contact.

8. Steam or hot-water pipes shall not be used for a protector ground.

(i) Requirements for Signal—Protectors. The protector to be approved shall comply with the following requirements:

1. It shall be mounted on a noncombustible, nonabsorptive insulating base, so designed that when protector is in place all parts which may be alive will be thoroughly insulated from the surface on which the protector is mounted.

2. It shall have an arrester between each line wire and ground and a fuse in each line wire.

3. The fuses shall be so placed as to protect the arresters.

4. The protectors terminals shall be so marked as to indicate clearly the "line," "instrument" and "ground" terminals.

Exception: Orders 1391 (c) to (i) inclusive do not apply when the entire circuit is run in underground conduit from the central station to the block in which the building is located, provided the circuit within the block is so placed as to be free from chance of accidental contact with electric light and power wires of over 250 volts.

(j) Wires Inside Buildings.

1. Wires beyond the protector, or wires inside buildings where no protector is used, shall be insulated, neatly arranged and securely fastened in place, in a convenient and workman-like manner.

2. They shall not come nearer than two inches to any electric light or power wire in the building, unless inclosed in conduit or separated therefrom by a continuous and firmly fixed nonconductor creating a permanent separation; this nonconductor shall be in addition to the insulation on the wire.

3. Where wires are bunched together in a vertical run within any building, they shall have a fire-resistive covering sufficient to prevent the wires from carrying fire from floor to floor, unless they are run either in noncombustible tubing or in a fire-proof shaft having fire stops at each floor.

4. Signal wires and supply wires may run in the same shaft, provided that one of these classes of wires is run in noncombustible tubing, or provided that when run otherwise these two classes of wires shall be separated from each other by at least two inches.

5. In no case shall signal wires be run in the same tube or terminate in the same box with supply wires.

(k) Transformers and Other Devices.

1. Transformers or other devices for supplying current to signalling system from light, heat or power circuits shall be of a design which will adequately protect the signalling system.

2. The primary wiring shall be installed in accordance with the rules for electric light and power inside wiring (section 134) and the secondary wiring in accordance with the orders of this section.

Order 1392. Other Protective Requirements for Equipment Connected to Signal Circuits Exposed to Supply Lines or Lighting.

(a) Guarding Noncurrent-Carrying Parts.

1. Where telephone or other signal apparatus (not included under a-2 below) which must be handled by persons, is permanently connected to overhead signal circuits exposed to lighting or to supply lines over 400 volts to ground, provision against shock to persons handling apparatus shall be made by one of the following methods:

(1) The use of suitable protective devices, such as fuses and arresters, and also for conditions of unusual exposure, drainage coils or transformers or both.

(11) The arrangement of apparatus in such a way that persons using it will be obliged to stand on a suitably insulated platform, in a suitably insulated booth or on other insulating surfaces. (The above applies only where apparatus is accessible to none but authorized persons.)

(III) The arrangement of apparatus (on signal circuits exposed to supply lines of more than 750 volts to ground) so as to have no exposed current-carrying parts exceeding 2 square inches in area with which a person is liable to come in contact and the use of suitable protective devices, including fuses and arresters or other means.

Exception: Portable telephones need not be so protected.

2. Such signalling devices as fire and police alarm boxes and telegraph test boxes, if connected to overhead signal circuits exposed to lightning or to supply lines over 400 volts to ground, shall have the accessible noncurrent-carrying metal parts permanently grounded wherever the character of service gives valid objection to the use of arresters or transformers on the signal circuit.

(b) Guarding Current-Carrying Parts.

1. Telephone or other signalling devices which are permanently located outdoors or where exposed to corrosive fumes or dampness (such as may occur in subways, cellars, basements, laundries, stables, etc.) shall be so arranged that all ungrounded current-carrying parts are so guarded as to be suitably protected against breakdown of insulation under the prevailing atmospheric conditions.

2. Under the conditions of (1) above, cords shall be guarded by shields of permanently grounded metal (such as metal armor) or nonabsorptive insulating material (such as flexible insulating tubing) or shall have suitable insulating coverings for the individual conductors.

3. Where no protective device is installed (permissible only for fire alarm or similar apparatus or for apparatus not for public use, where the character of the service precludes the use of arresters and fuses) the shields of cords shall always be of grounded metal or of special insulating material suitable to withstand the highest supply circuit voltage to which the signal circuit is exposed up to 7500 volts.

(c) Protection Against Induced Voltages.

1. All telephone or other signalling equipment, must be handled by persons and which is connected to a line that parrallels a supply line in such manner that by reason of exposure to the supply line under normal conditions more than 150 volts are induced between the terminals of the signalling equipment and ground, shall be protected by one or more of the following methods:

(I) All exposed metal parts of the equipment shall be insulated from the circuit, and the circuit shall be protected by arresters having a breakdown potential not exceeding one-half that of the insulation between the above-named noncurrent-carrying metal parts and the current-carrying parts. Cords shall have an additional insulating tubing protection.

(II) All exposed noncurrent-carrying metal parts shall be permanently grounded and all current-carrying metal parts shall either be permanently grounded or adequately shielded. (See b above).

(III) All equipment shall be so located that persons coming in contact with the equipment shall be obliged to stand either on an insulated platform or in a booth of suitable insulating material.

Order 1393. Wiring of Radio Signalling Apparatus. In setting up radio signalling apparatus all wiring pertaining thereto shall conform to the other provisions of this code that apply for the class of work installed and to the following additional requirements:

Order 1394. Requirements for Radio Receiving Stations Only.

(a) Antenna

(1) Antennas outside of buildings shall not cross over or under electric lights or power wires of any circuit of more than two hundred and fifty volts nor shall it be so located that a failure of either antenna or of the above mentioned electric light or power wires can result in a contact between the antenna and such electric light or power wires.

(2) Antennas shall be constructed and installed in a strong and durable manner and shall be so located as to prevent accidental contact with light and power wires by sagging or swinging.

(3) Splices and joints in the antenna span, unless made with approved clamps or splicing devices, shall be soldered.

Exception: Antenna installed inside of buildings are exempted from all of the above requirements.

(b) Lead-in-Wires.

(1) Lead-in-wires shall be of copper, copper-clad steel or other metal which will not corrode excessively.

(2) Lead-in-wires shall not be smaller than No. 14 A. W. G.

Exception: Copper-clad steel wire of No. 17 A. W. G. or larger may be used.

(3) Lead-in-wires on the outside of buildings shall not come nearer than four inches to electric light and power wires unless separated therefrom by a continuous and firmly fixed non-conductor that will maintain permanent separation. The non-conductor shall be in addition to any insulation on the wire.

(4) Lead-in wires shall enter building through a non-combustible, nonabsorptive insulating bushing.

(c) Protective Device.

(1) Each lead-in wire shall be provided with an effective protective device properly connected and located (inside or outside the building) as near as practicable to the points where the wire enters the building. The protector shall be isolated from easily ignitable materials or explosives, inflammable flyings or gases.

(d) Disconnecting Switch

A switch for disconnecting the receiving apparatus from the antenna shall be provided.

(e) Protective Ground Wire

(1) The ground wire shall be of copper or copper-clad steel. If of copper the ground wire shall not be smaller than No. 14 A. W. G. and if of copper-clad steel it shall not be smaller than No. 17 A. W. G. The ground wire shall be run in as straight a line as possible to a permanent and effective ground. Preference shall be given water piping. Gas piping shall not be be used for grounding protective devices.

(2) The ground wire shall be protected against mechanical injury.

(3) An effective ground clamp shall be used wherever the ground wire is connected to pipes or piping.

(f) Wires Inside Buildings

Wires inside buildings shall be securely fastened in a workmanlike manner and shall not come nearer than two inches to any electric light or power wire unless separated therefrom by some continuous and firmly fixed nonconductor making a permanent separation. This non-conductor shall be in addition to any regular insulation on the wire.

(g) Receiving Equipment Ground Wire

(1) The ground conductor shall be of copper, copper-clad steel or other metal which will not corrode excessively under existing conditions.

(2) The ground conductor shall not be smaller than No. 14 A. W. G.

Exception: Copper-clad steel wire of No. 17 A. W. G. or larger may be used.

(3) Receiving equipment ground wire may not be used as ground conductor for the protective device unless it is installed in the manner required by (e) above.

Order 1395. Requirements for Radio Transmitting Stations.

(a) Antenna

Antennas outside of buildings shall conform to the requirements of Order 1391-a.

(b) Lead-in-Wires

(1) Lead-in-wires shall be of copper, copper-clad steel or other metal which will not corrode excessively.

(2) Lead-in-wires shall not be smaller than No. 14 A. W. G.

(3) Antenna and counterpoise conductors and wires leading therefrom to ground switch, where attached to buildings, shall be firmly mounted five inches clear of the surface of the building, on non-absorptive insulating supports such as treated wood pins or brackets equipped with insulators having not less than five inch creepage and air gap distance to inflammable or conducting material.

(4) In passing the antenna or counterpoise lead-in into the building, a tube or bushing of non-absorptive insulating material shall be used and shall be installed so as to have a creepage and air-gap distance of at least five inches to any extraneous body. If porcelain or other fragile material is used it shall be installed so as to be protected from mechanical injury.

(c) Protective Grounding Switch

(1) A double-throw knife switch having a break distance of four inches and a blade not less than one-eighth by one-half inch shall be used to join the antenna and counterpoise lead-ins to the ground conductor.

(2) The base of the switch shall be of non-absorptive insulating material. Note: Slate base switches should not be used.

(3) This switch shall be so mounted that its current-carrying parts will be at least five inches clear of the building wall or other conductors and located as nearly as possible in a direct line between the lead-in conductors and the point where ground connection is made.

(d) Protective Ground Wire

(1) Antenna and counterpoise conductors shall be affectively grounded at all times when the station is not in actual operation (unattended) by a conductor at least as large as the lead-in and in no case smaller than No. 14 A. W. G. copper or copper-clad steel.

(2) The ground conductor from grounding switch to ground connection shall be securely supported and run to the same type of ground connection and in the same manner as required by Order 1394-e.

(e) Operating Ground Wire

(1) The radio operating ground conductor shall be of copper strip not less than three-eighths inch wide by one sixty-fourth inch thick, or of copper or approved copper-clad steel wire having a periphery or girth (around the outside) of at least three-quarters inch (for example a No. 2 A. W. G. copper wire.)

(2) The radio operating ground conductor shall be firmly secured in place throughout its length and protected and supported in the same manner as required for lead-in conductors by Order 1334-b.

(f) Operating Ground

(1) The operating ground conductor shall be connected to a permanent and effective ground.

(2) This ground and ground connection shall conform to Order 1394-e.

(g) Power from Street Mains

(1) When the current supply is obtained directly from street mains, the circuit shall be installed in metal conduit, armored cable or metal raceways.

(2) If lead covered wire is used it shall be protected throughout its length in metal conduit or metal raceways.

(h) Protection from Surges

(1) In order to protect the supply system from high-potential surges and kick-backs there shall be installed in the supply line as near as possible to each radio-transformer, rotary spark gap, motor in generator sets and other auxiliary apparatus one of the following:

1. Two condensers (each of not less than one-half microfarad capacity and capable of withstanding six hundred volt test) in series across the line and mid-point between condensers grounded; across (in parallel with) each of these condensers shall be connected a shunting fixed spark-gap capable of not more than one-thirty-second inch separation.
2. Two vacuum tube type protectors in series across the line with the mid-point grounded.
3. Non-inductively wound resistors connected across the line with mid-point grounded.
4. Electrolytic lighting arresters such as the aluminum cell type.

2. In no case shall the ground wire of surge and kick-back protective devices be run parallel with the operating ground wire when within a distance of thirty feet.

(3) The ground wire of the surge and kick-back protective devices shall not be connected to the operating ground or ground wire.

(i) Suitable Devices

Transformers, voltage reducers, keys, and other devices employed shall be of types suitable for radio operation.

PART 4. SAFETY MEASURES TO BE OBSERVED IN THE OPERATION OF ELECTRICAL EQUIPMENT AND LINES

SECTION 140. GENERAL REQUIREMENTS.

(To be Observed by all Employers of Electrical and Signal Workmen)

Order 1400. Qualifications of Employes. The employer shall use every reasonable means and precaution to assure himself that each employe is mentally and physically qualified to perform his work in accordance with these rules. No employe shall be permitted to do work upon or in proximity to dangerous live electrical lines or equipment, or in such position as to permit of the establishment of contact, unless he is properly qualified or is under the direct supervision of an experienced and qualified person.

Workmen whose employment incidentally brings them in the neighborhood of unguarded electrical supply equipment or lines with the dangers of which they are not familiar shall always be accompanied by and work under the supervision of a properly qualified and authorized person.

Order 1401. Instructing Employes.

(a) Employes regularly working on or about live electrical equipment or lines shall be thoroughly instructed in methods of first aid, resuscitation and when necessary in fire extinguishment.

All such employes shall be instructed as to the character of all electrical equipment or lines on or dangerously near to which work must be done by them. Instructions shall describe the equipment and lines to be worked on, identifying them by position, letter, color, number, or name.

Order 1402. Responsibility.

(b) If more than one person is engaged in work on or about the same electrical equipment or lines at any one location, one of the persons shall be designated as the foreman locally in charge of the work; or all the workmen shall be instructed as to the work they are to perform and the employe instructing the workmen shall be considered in charge of the work.

Order 1403. Attendance

Unless a properly qualified employe is in constant attendance in rooms where generators and other supply equipment are in operation, such rooms shall be made inaccessible to other than qualified persons.

Order 1404. Requirements for Two Workmen.

Except in trouble or emergency work, at least two employes shall be provided where work is done on live lines above 750 volts in wet weather or at night.

Order 1405. Uninstructed Workmen and Visitors.

Unqualified employes or visitors shall be prohibited from approaching any live parts unless accompanied by a qualified person.

Order 1406. Protective Devices.

(a) There shall be provided in conspicuous and suitable places in electrical stations, telephone exchanges, testing departments, and line construction and repair wagons, a sufficient supply of suitable protective, first aid, and fire extinguishing devices and equipment, to enable employes to meet the requirements of these orders. Such devices and equipment shall be periodically inspected or tested to insure that they are kept in good order. Safety belts and similar equipment, whether furnished by employer or employe, shall be inspected from time to time to assure that they are in safe working condition.

(b) Employes that work on or near live parts shall be required by the operating rule (see order 1410) to use the protective devices and the special tools provided, first examining them to make sure that these devices and tools are suitable and in good condition. Employes shall further be required to wear suitable clothing while working on or about live equipment and lines. When working under these conditions, they shall be warned to keep sleeves down and avoid wearing unnecessary metal or inflammable articles such as rings, watch or key chains, metal cap visors, celluloid collars or celluloid cap visors, nor to wear loose clothing and shoes that slip easily when working near moving parts.

Order 1407. Warning and Danger Signs.

There shall be displayed in conspicuous places at all unattended or unlocked entrances to electrically supply stations, substations and testing rooms containing exposed current-carrying parts, permanent warning signs forbidding entrance to unauthorized persons. Suitable danger signs shall be placed in supply stations, sub-stations, switching towers and testing rooms about equipment having exposed current-carrying parts above 750 volts.

Order 1408. Safe Supports, Safety Belts and Tools.

(a) Safe Supports. (1) Employes shall be instructed and required not to support themselves on any portion of a tree, pole, structure, scaffold, ladder, or other elevated structure without first making sure that the supports are strong enough, reinforcing them if necessary.

(2) Ladders used on or near dangerous live electrical equipment or lines shall not be painted with conducting paint or reinforced lengthwise with metal.

(b) **Safety Belts.** Employes shall be instructed and required not to work in elevated positions unless secured from falling by a suitable safety belt or by other adequate means, and to exercise care to see that the snaps or fastenings are properly engaged and that they are secure in their belts before intrusting their weights to the belts.

(c) **Tools and Materials.** Employes shall be instructed and required to take the necessary precautions to avoid dropping tools or materials from elevated positions, and to use handlines and proper receptacles for raising or lowering them.

SECTION 141. OPERATING RULES.

Order 1410. Utilities to Adopt Operating Rules.

(a) All utilities, who regularly employ three or more men, shall adopt and strictly enforce an adequate set of operating rules designed to attain the safety of such employes through the observation of the necessary precautions while at work on or near dangerous live parts.

(b) The operating rules adopted shall contain the general requirements of part 4 of this code, insofar as they apply to the specific plant and work of any utility, and such additional rules as may be necessary to reduce the hazards of operation to a minimum.

(c) Operating rules shall be filed with the Commission within six months of the time these orders take effect.

Order 1411. Distribution and Posting of Operating Rules.

Each employe shall be provided with a printed or typewritten copy of the operating rules or that section of the rules which applies to his work, or such rules shall be posted conspicuously in the office, station, testing rooms, line wagons, and other work places of the employer where the number of employes and the nature of the work warrants.

Order 1412. Knowledge of Safety Rules and Reporting Defects.

(a) Employers shall require employes to study and familiarize themselves with the safety rules adopted pursuant to order 1410 and shall from time to time test their knowledge of the rules as well as their knowledge of approved methods of first aid, resuscitation and fire extinguishment.

(b) Employes shall be required to promptly report to their superiors any dangerous conditions of equipment or surroundings, in stations, on overhead or underground lines, of interior wiring connected to lines, and all features which they note that may endanger life and property.

Order 1413. Organization Diagram.

The employing utility shall prepare and distribute or post conspicuously an organization chart or written statement which clearly shows to whom each employe is responsible and what person is in direct charge of each phase of the work down to and including the grade of foremen.

Order 1414. Address List and Emergency Rules.

Each employee, whose work is such as to require it, shall be furnished with instructions indicating the individual or individuals to be called in case of emergency, and rules for first aid and resuscitation and fire extinguishment.

Order 1415 Chief Operator.

Each electrical utility shall place a properly qualified person in charge of the operation of electrical equipment and lines and shall make such qualified person directly responsible for their safe operation.

The repeal of the orders indicated above will become effective thirty days after publication, namely Sept. 13, 1922. The new orders herewith printed will become effective on the same date.

INDUSTRIAL COMMISSION OF WISCONSIN
F. M. Wilcox, Chairman,
R. G. Knutson,
L. A. Tarrell,
Commissioners.

Attest:
A. J. Altmeyer, Secretary.

Published August 14, 1922

ORDERS OF THE INDUSTRIAL COMMISSION

Pursuant to Sections 2394-31 to 2394-70, inclusive, of the Statutes, the Industrial Commission, on June 5, 1922, amended General Order 5225 of the Building Code, and General Order 6037 of the General Orders on Existing Buildings, as follows:

Order 5225—All electrical work shall conform to the Wisconsin State Electrical Code, comprising General Orders 1000-1499 inclusive of the Industrial Commission.

Order 6037—All new electrical work shall conform to the Wisconsin State Electrical Code, comprising General Orders 1000-1499 inclusive of the Industrial Commission.

All electric wiring and installation which by reason of insufficient supports, defective insulation, contact with combustible materials, or with conductors of electricity, deterioration, faulty materials or from any other cause, is liable to cause fire shall forthwith be overhauled, repaired or replaced, and made safe, and all such repair work shall be done as required by said Wisconsin State Electrical Code.

Decorations of paper, cotton, cloth or other combustible materials shall not be attached to electric light wires, globes or fixtures, nor within three feet of any open lights.

Electric cords shall not be hung on or be fastened with or come in contact with nails, staples, hooks, gas or water pipes, machinery or other metal supports.

Pendant lamps must be free from contact with furniture, machinery, posts or other fixtures.

Where portable electric lights must be used the same shall be equipped with socket of non-combustible, non-absorbent insulating material, large handle of non-absorbent insulating material, basket guard, proper reflector and special heavy duty cord of the reinforced or similar type.

The amendment of the orders indicated above will become effective thirty days after publication, namely September 13 1922.

INDUSTRIAL COMMISSION OF WISCONSIN.
F. M. Wilcox Chairman
R. G. Knutson,
L. A. Tarrell,
Commissioners.

Attest: A. J. Altmeyer, Secretary.

Common Council Proceedings

CITY OF MADISON, WIS.
ADJOURNED REGULAR MEETING
June 30, 1922
7:30 P. M.
COUNCIL CHAMBER, CITY HALL
OFFICIAL RECORD

Mayor Kittleson in the chair.

Roll called.

Present: Aldermen Barry, Behrend, Breitenbach, Dowling, Elver, Fessler, Gibbs, Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte—19.

Absent: Aldermen Comeford and Starr.

The reading of the minutes of the previous meeting was dispensed with and record approved.

BUSINESS PRESENTED BY THE MAYOR

Appointment of special policemen, Geo. Kemmer, at Strand theater without pay from the city.

On motion of Ald. Sullivan the appointment was confirmed.

REPORTS OF OFFICERS

The Clerk reported the filing by the Clerk of Superior court statement of costs collected in city cases, total $326.91. Placed on file.

To the Mayor and Common Council.
Gentlemen:

I am transmitting herewith specifications for the drilling of a new well as provided in the $40,000 bond issue. These specifications have been revised and approved by Mead and Seastone and I recommend that they be adopted and that the Board of Public Works be authorized to advertise for bids.

Respectfully submitted,
L. A. SMITH,
Superintendent.

On motion of Ald. Stock the specifications above referred to were unanimously approved on call of the ayes and noes.

REPORTS OF COMMITTEES

By the Committee on Supplies:
To the Mayor and Common Council,
City of Madison.
Gentlemen:

Complying with Alderman Fessler's resolution, as adopted by the Common Council directing the Committee to purchase street signs in accordance with the budget provision, your Committee reports that it has asked for and received bids for the furnishing of street signs, and samples were submitted.

The Riesen-Schmidler Sign Company of Madison submits a bid on Exhibit 2 on a two (2) way name panel street sign, f. o. b. Madison, of $3.15 each in lots of five hundred or more; on a four (4) way name panel street sign f. o. b. Madison $4.21 each, in lots of five hundred or more. A bid for the complete installing of five hundred signs by setting the posts in concrete and putting on the plates is also submitted, the bid being in the sum of five hundred seventy-five ($575) dollars.

The Universal Highway Sign Company of Minneapolis, Minnesota, submits a bid as per sample of their exhibit on two (2) way name panel street signs f. o. b. St. Paul, Minnesota, of $5.10 each, and on their four (4) way name panel street signs f. o. b. St. Paul of $6.80 each.

Your Committee has not awarded the contract, and submits this report to you for your consideration.

Respectfully submitted,
ASA B. GROVES,
Chairman.

The resolution referred to and reported back was as follows:
Resolution.
By Alderman Fessler:

WHEREAS, provision was made in the 1922 budget for the erecting or placing of suitable signs at street intersections indicating or designating the name of the street, and

WHEREAS, a great many streets in the east end of the City have absolutely no signs of any description to guide persons in their endeavor to find or locate certain streets or courts, therefore, be it

RESOLVED, that the Committee on Supplies be and it is hereby instructed to purchase suitable street signs for such streets as are not now supplied with same, in the amount not to exceed the budget provision.

On motion of Ald. Barry the above report and accompanying resolution was adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Dowling, Elver, Fessler, Oakey, Proctor, Rhode, Steffen, Stock, Sullivan and Trachte—13.

Negative: Aldermen Gibbs, Groves, McGowan, Quinn—4.

Alderman Brown then took his seat.

By the Committee on Finance:
To the Mayor and Common Council,
City of Madison.
Gentlemen:

Your Committee on Finance has had under further consideration the resolution authorizing the issue of special street improvement bonds in the amount of one hundred and seventy thousand ($170,000) dollars, the same being for the purpose of improving the streets which are duly enumerated in the accompanying resolution, and are for the purpose of paying for improvements of said streets and are duly chargeable to the property benefited thereby.

For the Committee on Finance,
By JOHN STOCK, JR.,
Chairman.

Two resolutions accompanied the report as follows:

By the Committee on Finance:

Resolved, that there be and hereby is authorized an issue of Special Street Improvement Bonds in the amount of one hundred and fifty thousand ($150,000.00) dollars in three hundred (300) bonds of $500.00 each, numbered from No. 1 to No. 300 both inclusive and issued under the provisions of the City Charter and the acts amendatory thereof, for the purpose of paving improvements chargeable to the property benefited on the following streets, or parts of streets, viz:

Breeze Terrace, University Ave. to Regent St.	$15,500.00
Chadbourne Ave., Prospect Ave. to Allen St.	5,000.00
Chamberlain Ave., Forest Ave. to Ash St.	8,500.00
Corry St., Atwood Ave. to C., M. & St. P. tracks	4,500.00
Dunning and Yahara Sts., Oakridge Ave. to Lake Monona end of pavement to Dunning	4,300.00
Edgewood Ave., Monroe St. to Fox Ave.	5,750.00
Elmside and Lakeland Ave., Willard to Lakeland Ave., Miller to Elmside St.	7,500.00
Fox Ave., Prospect Ave. to Commonwealth Ave.	12,000.00
Hamilton St., Mifflin St. to Johnson St.	8,000.00
Hudson Ave., Oakridge Ave. to Atwood Ave.	8,000.00
Jenifer St., Rogers St. to Cantwell Ct.	1,500.00
Lakeland Ave., Division St. to Schiller Ct.	7,300.00
Ludington Ave., Oakridge Ave. to Atwood Ave.	6,250.00
Miller Ave., Lakeland Ave. to Atwood Ave.	10,500.00
Ohio Ave., Oakridge Ave. to Atwood Ave.	7,750.00
Packers Ave., North St. to City Farm	11,250.00
Prospect Ave., Monroe St. to Fox Ave.	5,600.00
Ray St., Spooner St. to Harrison St.	4,000.00
Spaight St., Russel Wlk to Walton Pl.	4,800.00
Van Hise Ave. and Ash St., Prospect Ave. to Ash St., Van Hise St. to Chamberlain Ave.	12,500.00
	$150,000.00

Said bonds being issued to pay that part of the cost of said improvements on the street above named which is chargeable to the abutting property, and not as a general city liability; the bonds to be dated April 1, 1922, to bear interest at the rate of five and one-half per cent per annum, payable annually at the office of the City Treasurer on the first day of April of each year, as evidenced by interest coupons attached to each bond respectively, and the bonds to be issued that one-tenth of the total amount hereby authorized will become due and payable at the City Treasurer's office on the first day of April of each succeeding year for the ensuing ten years.

For the Committee.
By JOHN STOCK, JR.,
Chairman.

By the Committee on Finance:

RESOLVED, that there be and hereby is authorized an issue of Special Street Improvement Bonds to the amount of twenty thousand ($20,000.00) dollars in forty (40) bonds of five hundred ($500.00) dollars each, numbered from No. 1 to No. 40 both inclusive, and issued under the provisions of the City Charter and the acts amendatory thereof, for the purpose of paving improvements chargeable to the property benefited on the following streets, or parts of streets, viz:

Prospect Pl., end of pavement to end of plat	$ 500.00
Sutherland Ct. Winnebago St. to Main St.	2,000.00
Vilas St., Van Buren St. to Edgewood Ave.	6,500.00
Walton Pl., Helena St. to Yahara Pl.	6,500.00
West Lawn Ave., end of pavement to Monroe St.	4,500.00
	$20,000.00

Said bonds being issued to pay that part of the cost of said improvements on the streets above named which is chargeable to the abutting property, and not as a general city liability, the bonds to be dated April 1, 1922, to bear interest at the rate of five and one-half per cent per annum payable annually at the office of the City Treasurer on the first day of April of each year, as evidenced by interest coupons attached to each bond respectively, and the bonds to be issued that one-tenth of the total amount hereby authorized will become due and payable at the City Treasurer's office on the first day of April of each succeeding year for the ensuing ten years.

For the Committee,
By JOHN STOCK, JR.,
Chairman.

On motion of Alderman Stock the above report and accompanying resolutions were unanimously adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Brown, Dowling, Elver, Fessler, Gibbs, Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte—18.

None voting in the negative.

Report of License Committee:
To the Mayor and Common Council,
Gentlemen:

The License Committee have had the following applications under consideration and report back herewith recommending that the permits be granted, viz:

Fauerbach Brewing Co., 651 Williamson St.
J. L. Meloy, 114 E. Main St.
Adolph Milverstedt, 306 W. Mifflin St.
John R. McGilligan, 510 E. Wilson St.
W. J. Lynch, 134 S. Blair St.
Hausmann Brewing Co., 333 State St.
Nick A. Meyer 217 E. Main St.
Frank Gema, 701 Milton St.
S. P. Ray, 221 S. Baldwin St.
Joseph Schmitt, 632 W. Washington Ave.
J. B. Esser, 2601 Winnebago St.
H. J. Shaughnessy, 205 E. Main St.
L. A. Haupt, 1603 Sherman Ave.
W. R. Baker, 601 E. Wilson St.
Paltz Bros. & Co., 110 N. Fairchild St.
Ben Stitgen, 120 W. Main St.

The Committee also reports back herewith recommending that the following theater licenses be granted:

Orpheum Theater, 113 Monona Ave.
Majestic Theater, 115 King St.
Parkway Theater, 6 W. Mifflin St.
Palace Theater, 1949 Winnebago St.
Strand Theater, 16 E. Mifflin St.
Grand Theater, 204 State St.
Orton Theater, 1207 Williamson St.

The Committee also reports herewith that careful consideration was given to the ordinance relating to an amendment to the theater ordinance and report and recommend that the ordinance be indefinitely postponed.

The Committee also reports that consideration was given the request for a change in the amount of license fees for beverage permits and reports herewith recommending that no change be made.

For the Committee,
E. E. GIBBS,
Act. Chairman.

The ordinance to amend the theater ordinance was reported back as follows:

By Alderman Sullivan:

AN ORDINANCE to amend paragraph (7) of section 6 of Chapter IV of the general ordinances of the City of Madison relating to theater licenses.

The Common Council of the City of Madison do ordain:

Paragraph (7) of section 6 of Chapter IV of the general ordinances of the City of Madison is hereby amended by striking out the world "twelve" where they appear therein and inserting in lieu thereof the word "fifteen," so that said ordinance when so amended shall read as follows:

(7) The license for theaters shall be as follows, to wit:

Every vaudeville theater, two hundred dollars; every moving picture theater or show house having a seating capacity of five hundred or less, seventy-five dollars; every moving picture theater or show house having a seating capacity of more than five hundred and less than fifteen hundred, one hundred and fifty dollars and fifty dollars additional if used for shows and exhibitions other than moving picture shows; every moving picture theater or show house having a seating capacity of more than fifteen hundred, three hundred dollars. In the event benches are used, twenty-two inches of space provided for seating shall constitute a seat. Every edifice used for the purpose of dramatic or operatic or other representations, plays or performances, for admission to which entrance money is received, not including halls or armories rented or used occasionally for concerts or theatrical representations, and not including edifices owned by religious, educational or charitable institutions, societies or organizations where all the proceeds from admissions inure exclusively to the benefit of such institutions, societies or organizations or exclusively to the benefit of persons in the military or naval forces of the United States shall be regarded as a theater.

Section 2. This ordinance shall take effect and be in force from and after the 30th day of June, 1922.

Alderman Gibbs moved that the request for change in the license fee as mentioned in the report be indefinitely postponed. The motion was lost on call of the ayes an noes by the following vote:

Affirmative: Aldermen Brown, Dowling, Gibbs, Oakey, Proctor, Rhode, Steffen—7.

Negative: Aldermen Barry, Behrend, Breitenbach, Elver, Fessler, Groves, McGowan, Quinn, Stock, Sullivan and Tratche—11.

Alderman Behrend then moved that the ordinance relating to the license for beverages containing alcohol be amended by reducing the license fee to $50 instead of $100.

There not being enough Council members present to constitute a majority vote, the motion was lost by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Elver, Fessler, Groves, McGowan, Quinn, Stock, Sullivan—10.

Negative: Aldermen Brown, Dowling, Gibbs, Oakey, Proctor, Rhode, Steffen and Trachte—8.

On motion the report was then unanimously adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Brown, Dowling, Elver, Fessler, Gibbs, Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte.

None voting in the negative.

Alderman Quinn for the Ordinance Committee reported that there had been some discussion regarding the dance hall license, but owing to the fact that this ordinance required considerable attention, requested that it be held over until such time that it could be brought before the public for joint discussion with the Council members. It was also agreed that all licenses which are issued on July 1st, 1922, be held in abeyance until such time as the ordinance in question is disposed of.

By the Committee on Finance:
To the Mayor and Common Council,
City of Madison.
Gentlemen:

Your Committee has given further consideration to the ordinance authorizing the issue of bonds of the City of Madison in the sum of thirty-five thousand ($35000) dollars for street improvement the same being General City Liability Bonds and being issued for the purpose of covering the cost of intersections of the streets duly enumerated in the accompanying ordinance and recommends that the same be passed.

For the Committee.
By JOHN STOCK JR.,
Chairman.

The ordinance reported back was as follows:

"An ordinance authorizing the issue of bonds of the City of Madison, Wisconsin, in the sum of $35,000 for street improvements."

The ordinance was read a third time and on motion of Ald. Stock was unanimously adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Brown, Dowling, Elver, Fessler, Gibbs Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte.

None voting in the negative.

By the Committee on Finance:
To the Mayor and Common Council,
City of Madison.
Gentlemen:

Your Committee has also duly considered the communication submitted to the Council by the secretary of the Firemen's Pension Fund at its last meeting whereby the said Board of Trustees of the Firemen's Pension Fund will transfer to to the City General Fund the sum of eight thousand ($8,000) dollars, with the recommendation that the same be set up as a reserve fund, the purpose being that the said amount be used for the purpose of purchasing equipment for the Fire Department.

After due deliberation your Committee recommends that this sum of eight thousand ($8,000) dollars which is transferred to the General City Fund be placed in a separate fund to be known as the Fire Department Reserve Equipment Fund, and that this amount be held and is to be used only for the purpose of purchasing fire department equipment.

Your Committee has also had under consideration the communication submitted by James W. O'Connell, plumbing inspector, asking that an appropriation of thirty-five ($35) dollars be made to him, the same being for the purpose of defraying expenses incurred while attending the convention of the State Plumbers' Association.

Your Committee feels that owing to the fact that all traveling expenses were eliminated from the budget, and no department has a fund set aside for that purpose, that this request be not granted.

For the Committee on Finance,
By JOHN STOCK, JR.,
Chairman.

Alderman Brown asked for separate consideration on the above report. That part relating to the transfer of $8,000.00 to the City's General Fund to be used for purchase of equipment for fire department was unanimously adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Brown, Dowling, Elver, Fessler, Gibbs, Groves. McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte.

None voting in the negative.

For adoption of the Committee's report disallowing $35.00 expense money to James W. O'Connell the call of the roll resulted as follows:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Dowling, Elver, Fessler, Gibbs, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan—15.

Negative: Aldermen Brown, Groves, Trachte—3.

By the Committee on Finance:
To the Mayor and Common Council,
City of Madison.
Gentlemen:

Your Committee has duly considered the resolution as introduced by Alderman Stock, by request that the sum of five hundred ($500) dollars be appropriated in addition to the amount now provided in the 1922 budget for the celebration of Independence Day.

After due deliberation, and owing to the fact that the amount provided in the General City Contingent Fund has already been expended, the Committee feels that the sum of three hundred and seventy-five ($375) dollars be made available in addition to the two hundred ($200) dollars now provided in the budget, making a total of five hundred and seventy-five ($575) dollars.

The Committee further recommends that the Council adopt the resolution hereto attached appropriating three hundred and seventy-five ($375) dollars in addition to the two hundred ($200) dollars, and that the Mayor and City Clerk be and they are hereby authorized to sign a warrant on the City Treasurer in the said amount.

For the Committee on Finance,
By JOHN STOCK, JR.,
Chairman.

The resolution reported back was as follows:

By the Committee on Finance:

Resolved, that there be and there hereby is appropriated the sum of three hundred and seventy-five ($375) dollars and the City Auditor and Comptroller is authorized and directed to make such transfer of available funds from any department as may be necessary to meet the herein specified appropriation and make same payable to the treasurer of the Independence Day Celebration Committee, the same being for the purpose of assisting in meeting the general expenses of said Committee, and be it further

Resolved, that the Mayor and City Clerk be and they are hereby authorized to sign a warrant drawn on the City Treasurer in the amount specified.

On motion of Alderman Stock the above report and accompanying resolution was unanimously adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry Behrend, Breitenbach, Dowling, Elver, Fessler. Gibbs, Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte.

None voting in the negative.

By the Committee on Finance:
To the Mayor and Common Council,
City of Madison.
Gentlemen :

Your Committee has also given consideration to the communication submitted by E. E. Parker, City Engineer, in reference to repairs on Lake Wingra locks as ordered by the Railroad Commission.

After due deliberation the Committee recommends that the City Engineer be instructed to make a permanent cutoff on Lake Wingra locks and that the expense of same be charged back to the Lake Forest Land Company.

By JOHN STOCK, JR.,
Chairman.

The following resolution accompanied the report:

By the Committee on Finance:

Resolved, that the City Engineer be and he hereby is instructed to make a permanent cutoff on Lake Wingra locks, the same to comply with the request as made by the Railroad Commission, and that the City Auditor and Comptroller be and he hereby is duly authorized to use any available funds in order to have this work completed as soon as possible, and to have the same billed and made chargeable to the Lake Forest Land Company, and that the City Attorney be and he hereby is instructed to submit the same to the Lake Forest Land Company for collection.

On motion of Ald. Stock the above report and accompanying resolution was unanimously adopted on call of the ayes and noes by the following report:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Brown, Dowling, Elver, Fessler, Gibbs, Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte.

None voting in the negative.

ORDINANCES

An ordinance by Ald. Stock regulating auctioneers and auctions.

Read first and second times and referred to Ordinance Committee.

An ordinance by Ald. Groves relating to the prohibition and suppression of carnivals in the City of Madison.

Read first and second times and referred to Ordinance Committee.

RESOLUTIONS

By Ald. Groves:

Resolved, that the sum of $750 be refunded to Capt. Fred Finn, Company I, Wisconsin National Guard, from the monies received from the Morris & Castle Carnival Co., and be it further resolved, that the Mayor nd City Clerk be directed to draw a warrant on the City Treasurer for the payment of said refund.

On motion of Ald. Groves the rules were suspended and the resolution unanimously adopted on call of the ayes and noes by the following vote:

Affirmative: Aldermen Barry, Behrend, Breitenbach, Brown, Dowling, Elver, Fessler, Gibbs, Groves, McGowan, Oakey, Proctor, Quinn, Rhode, Steffen, Stock, Sullivan and Trachte.

None voting in the negative.

ADJOURNMENT

On motion the Council then adjourned.

H. C. BUSER,
City Clerk.
I. M. KITTLESON,
Mayor.

The Capiatl Times, August 14, 1922

OBITUARY

CASPER H. STORCK

Funeral services for Casper H. Storck, Blooming Grove, who died at the Madison General hospital Friday, were held at his home at 1:30 yesterday afternoon and later at Hope Lutheran church. The Rev. Mr. Pichler, Hope, officiated. Internment was made at Hope cemetery.

MRS. JOHN MORRIS

Funeral services for Mrs. John Morris, 815 E. Gorham st., who died Saturday, will be held at the home this afternoon at 2:30.

MRS. ANNA ERDALL

Funeral services for Mrs. Anna Erdall, 83, who died at her home, 1350 E. Dayton st., Friday, were held yesterday afternoon at the home at 2:30 and at Bethel Lutheran church at 3. The Rev. O. G. U. Siljan officiated. Interment was at Forest Hill cemetery.

NICHOLAS KONRAD

Nicholas Konrad, formerly of Madison, died Sunday morning, Aug. 13, in Los Angeles, Ca., according to word received today by Herman Gaertner, 826 State st. He is survived by two sons, Harold and Walter of Eau Claire. Funeral arrangements will be announced later, interment will be made at Forest Hill.

TO ATTEND FUNERAL

A special meeting of the Christian Mother's society of the Holy Redeemer church will be held in the church hall Tuesday after the regular church services. Arrangements will be made for attending the funeral of Mrs. William Kaether.

A. E. BERGGREN

Funeral services for Axel E. Berggren, university professor of steam and gas engineering, who died Thursday evening following an automobile accident on the Middleton road, were held at his home, 2237 Rowley ave., Saturday afternoon. Rev. George E. Hunt of Christ Presbyterian church officiated. Members of Hiram Masonic lodge, No. 50, gave the Masonic burial services at the grave. C. E. Shaffer delivered the Masonic address. Interment was at Forest Hill cemetery. No inquest will be held on the death of Prof. Berggren until A. K. Lien, Neillsville, the only eye witness, can be summoned by Coroner W. E. Campbell.

100 Dominican Sisters At Spiritual Retreat

More than 100 Dominican sisters from this and neighboring states have for the past 10 days been following the exercises of a spiritual retreat conducted at the Edgewood academy by the Rev. J. R. Clarke, pastor of the recently organized Blessed Sacrament parish in West Madison. The retreat immediately followed the close of a six weeks' summer school session ending Sunday morning at 7:30 mass.

OCONTO—Barney O'Grady, a pioneer of Oconto county, died here.

Dorothy Jardon, Grand Opera Star, Invents Audience Test

Famous Singer Finds Public Preference Is For Popular Ballads

From grand opera to vaudeville may not sound like progress to the uninitiated but Dorothy Jardon of Chicago Grand Opera fame has a different notion. When she entered vaudeville, admiring music lovers raised a cry of protest. They said Miss Jardon was throwing herself away and cited the grand opera opportunities she was giving up.

"They kept my mail heavy and my life miserable," Miss Jardon laughs. "They just wouldn't understand. But to be honest at the risk of being considered eccentric, I must go on record as regarding vaudeville and grand opera of equal importance artistically.

Soulful Themes

"Operatic roles are wonderfully satisfying, but there's no bigger thrill than that of putting over a heart stirring ballad like 'Wake Up Little Girl, You're Dreaming' or 'Why Should I Cry Over You' to a great audience.

"For after all, everybody must admit that more music lovers prefer ballads than grand opera. And why shouldn't they have what they want?

"Take 'Why Should I Cry Over You.' It's the kind of melody every love sick youth gets miserable happiness out of soulfully singing in the parlor at twilight.

Instinct Guides Music Tastes

"Besides, even in vaudeville, I sing arias from 'Thais' and 'Zaza.' But I'll tell you one thing—though there's applause aplenty for the aria, there's a positive thunder of approbation for the ballad that follows.

"I don't believe in 'educating the public.' Instinct guides in musical taste and should do so—that's my sentiment."

Blaine Says LaFollette Is Masses Friend

Governor Speaks Today At Reeseville; Selfish Interests His Foes

REESEVILLE, Wis. — "Senator La Follette is the greatest commoner living in the world today," said Gov. Blaine here today. "He thinks and speaks the wishes of the common masses.

"He is the friend of the men and women who bear the burdens of heavy labor—yes, and of little children who are wickedly exploited in factories and shops. He is loved by millions of unknown and lowly toilers in shops, in factories, in mines, and on the farms. He is hated, too, hated by the selfish classes that have too much and want more.

"Senator La Follette has blocked the way for sinister and greedy business that is not content with honest gain. The house of Morgan, the packers, the shipping trust, the railroad bond holders, the international bankers, and all their kind that make war on the poor, to grind their faces in the dust, are enemies of La Follette. By the same token we who look forward to a better day and are willing to work, are proud to march with La Follette.

"Were this a campaign of decency, there would be none to deny the senator re-election to the senate. He would be all but unanimously acclaimed the choice of Wisconsin's voters. But greed and cunning contrive by false tokens to blind some and corrupt others, and are opposed to any righteous cause. Christ was crucified, and so we have progressed since that time. Still the lust for power and pelf oppose and oppress those who seek to lift the people from bondage into a happy and hopeful life."

250 Cavalrymen Are Camping Here Today

Monona park this afternoon was made the camping grounds for 25 cavalrymen of the 14th U. S. Cavalry, regular army, who are marching from Camp Douglas to the station at Fort Sheridan, Ill. The men arrived from Cambridge, Wis., the first to arrive being the commissary department which purchased provisions in the city this morning to be used by the men who will be encamped here over night. The company leaves early Tuesday morning for Sauk City the scene of the next camp. The troops were stationed at Douglas as instructors for the militiamen who have been in training at the camp during the summer.

Blind Evangelist Will Hold Services In City

"I am not blind," is the assertion of the Rev. F. C. Callahan, evangelist of the Volunteers of America who arrived yesterday to hold healing services in Volunteers hall, S. Baldwin street. Though his physical sight is gone, Rev. Callahan says he is guided by spiritual light that has come to him through his 31 years of evangelical work. He has come to Madison after preaching in nearly every state in the Union, reaching thousands of persons with his healing services. He will hold his first outdoor service here tonight at the corner of Pinckney and E. Washington ave. Sunday morning at 10:30 in Volunteers hall he will hold a healing service. Sunday evening and Thursday afternoons at 3 o'clock indoor services will also be conducted.

"Big Five" Attorney Dies Of Heart Failure

CHICAGO— Levy Mayer, prominent attorney who for years has represented some of the nation's biggest interests was found dead today in his apartment in the Blackstone hotel. He died from heart disease. Mr. Mayer was nationally known through his actions as attorney for the "Big five" packers and for liquor interests. For several years he had represented these interests in their biggest cases.

Seven More File Claims Against Lake Forest Co

With only one day remaining to file claims against the Lake Forest Co., seven were entered in Circuit court today, totalling, 8,233. They are:

J. O. Ellickson, $5,000; William C. Otto, $425; W. F. Williams, $36 R. A. Turnbull, $350; Hannah and Olette Olson, $650, George Geier. $997; Valvoline Oil Co., $46.

All except the last charge breach of contract. That of the Valvoline Co. is for merchandise. Filing of claims is schedued to cose tomorrow.

Firemen Loses Jacket While Fighting Blaze

Joe Stormer, fireman at No. 1 station, is looking for a fleece-lined jacket lost while he was working at the blaze at Al's Restaurant, 406 E. Wilson st., Friday afternoon. The finder can reach Stormer at the station.

Read Capital Times Want Ads.

Drink Peddlers Barred From Soldier Camp Here

Running of liquor into the camp of the 14th U. S. cavalry, regular army, during its stay at Monona park tonight by local moonshiners will be prevented, it was stated by Acting Mayor Jacob Behrend this morning. **Officers of the detachment visited the mayor this morning and asked that a special officer be detailed to duty at the park to arrest all peddlers of intoxicating liquors about the camp. Officers stated, it was said by the mayor, that during their last stay in the city on the way to Camp Douglas some of the men were accosted by peddlers. Mayor Behrend referred the matter to the police department who will detail an officer to the park.**